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INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

Vol. XXVI. No. 1. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.]

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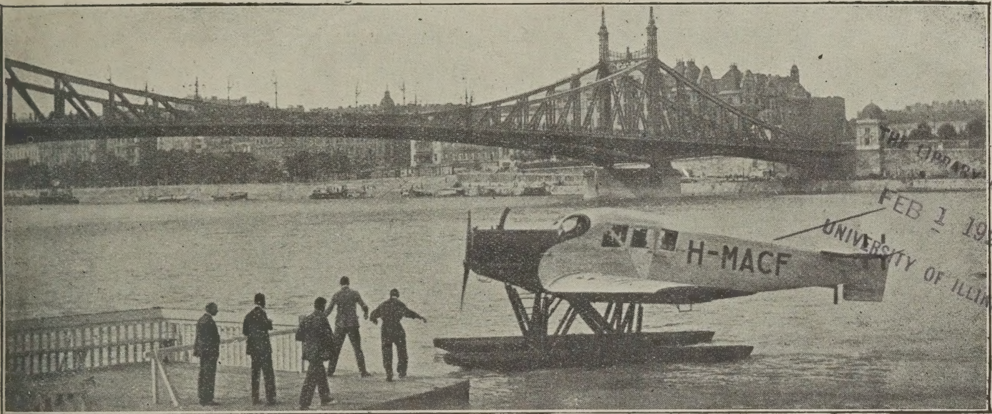

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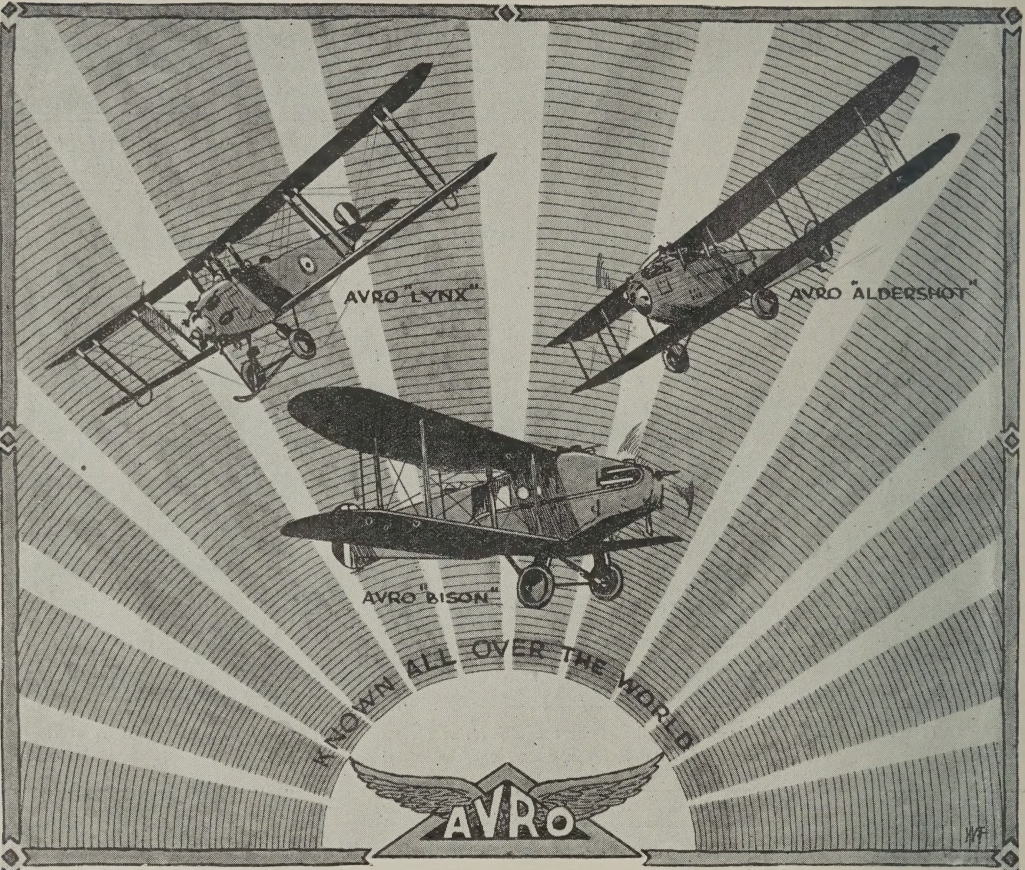

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ON THE LIMITATION OF AIRCRAFT.

How private official conversations leak out to the World's news-sheets is one of life's unexplained mysteries, and one of the most successful receptacles for such leakages is that eminent news-agency commonly known as *Reuter's*. On Dec. 22 the Washington correspondent of *Reuter* reported with an air of certainty that our Under-Secretary for Air, the Duke of Sutherland, now touring in the United States, had been discussing calling an International Conference on the limitation of air-armaments with Mr. Coolidge, President of the U.S.A.

The Duke was reported to have said :—"In view of the general conditions of Europe, I do not believe France would agree to any reduction in aircraft. Consequently a conference would be fruitless." And *Reuter* added that the Duke "seemed to hold the view, repeatedly expressed by responsible American officials, that the present time was unpropitious."

If the information be accurate it is good news, for if other nations refuse to discuss the limitation of aircraft then we cannot well limit our air defences. This is a matter of considerable importance at the moment, because it is currently reported in the manner of a stable tip straight from the horse's mouth that if a Labour Government should come into power this year one of its very first actions will be to cut down the Royal Air Force. And the result of the recent General Election, thanks to Conservative apathy and bad staff work, has been to make a Labour Government as nearly as possible a certainty.

One believes that Mr. Ramsay Macdonald is quite honest and that he means well. Also one disbelieves entirely that he and men like Messrs. Clynes, Thomas and Roberts are either under the thumb or in the pay of the Soviet Governmen in Moscow, as certain misleading newspapers would have us believe. But one does think that in their earnest endeavour to produce "Peace, Retrenchment and Reform" such men would very probably begin by tinkering with the Navy, the Army and the Air Force. Not being by nature of the governing class or even of the higher commercial class they cannot be expected to regard the Fighting Services as the guardians of the Nation's honour nor even as a remarkably cheap insurance policy on the nation's commerce. And this is quite apart from the schemes of the extreme Communists to destroy the Fighting Services and the Police by Bolshevist institutions such as Soldiers' and Sailors' Councils and by reinstating strikers and mutineers.

If an International Conference on the limitation of air armament did by any chance agree to limit aircraft a Labour Government might easily be tempted to go beyond the agreed limitations, so that danger at least will be avoided if no such conference takes place.

Being fighters with words and not with deeds a Labour Cabinet might well believe that the surest way of preventing fight is to have nothing with which to fight, much as a dumb man cannot be drawn into a political argument. They may easily forget that the dumb man, being unable to argue, has to let the verdict go against him by default and that the man who is unable to fight has to knuckle down to those who can and will fight. But if other nations openly refuse to reduce their air forces then even a pacifist Labour Government cannot be so blind as to reduce the R.A.F.

France certainly aims at being the World's greatest air power and will as certainly fail to achieve that aim, even by neglecting to pay her war debts and running herself as she has done into national bankruptcy. The United States has about the second best air force after our own, and the U.S. Government knows Japan's intentions too well to consider for a moment any reduction or limitation of her Service aircraft. Japan, though momentarily disorganised by the recent earthquake, has no idea of abating her ambitions to acquire the Philippines, and the Dutch East Indian oil fields—hence our projected naval and air base at Singapore—and Japan's air stations and aircraft matériel were left untouched by the earthquake. And Russia (or the Union of Soviet Republics) is openly setting out to procure and ultimately to build a colossal air fleet with which to fight the "Western Bourgeoisies"—as the Soviet documents put it.

Germany, our natural ally against the Eastern Barbarians, is being as the Scots say "sair hodden doon" by the French. And one doubts whether even a Labour Government would be able to alter French views or to bully French politicians to the extent of getting permission for Germany to build up such air force as to protect Western civilisation against everything East of Warsaw.

But it would be a very great help to us and to all the white race, which means civilised Europe and the United States and the British Dominions over-seas, if the Government of the United States were to declare as publicly as possible that so far from limiting its aircraft its intention was to build the biggest possible air fleet in the smallest possible time. Then even a Labour Government might believe that an adequate air force is necessary to the salvation of the British people.—C. G. G.

NEW YEAR REFLECTIONS.

Quite why the calendar makers should have chosen this particular season as that appropriate to the beginning of a New Year, and thus have committed us to the task of making new resolutions in the most dismal of climatic conditions one has never quite understood. Presumably there is some connection between this phenomenon and that of the tradition of the virtue of waking up and getting about one's business in those small hours when the day is as yet insufficiently aired and the mind and body are at their most inert. How much easier it might be not only to make good resolutions but to make some pretence of keeping them if New Year's Day fell at about the end of May.

Still the New Year does start to-day, and more or less with it Civilian Aviation in this country enters upon a new phase —and it is eminently to be desired that those who are to be responsible for the conduct of the Imperial Air Transport should now make and hereafter keep a certain number of good resolutions. Perhaps after all the New Year is appropriately timed for Air Transport concerns in this country—there is little Air Transporting to be done so that they have the time for resolving.

To make Civilian Aviation pay—which is after all the task before the new Company—many things remain to be done. Some of these things the Company can do directly.

All those problems directly affecting the practical operation of an air service, such as those concerned in the maintenance of a regular and reliable service under bad weather conditions, in fog, or at night can only be solved by actual operation.

So also with many of the problems of organisation—both so far as concerns the inducing of paying traffic and the actual handling of that traffic when it is induced.

Problems of this type generally speaking are not very greatly affected by the detailed characteristics of the particular type of aircraft actually in service, provided that the aircraft in question are capable of maintaining a service of one kind or another. That is to say that there is a good deal to be done which need in no wise wait for the coming of new and more efficient aeroplanes.

There seems reason to believe that the staff of the new Company will be fully alive to the scope for operational development of this type. But it is very obvious that new aeroplanes and better aeroplanes than any that now exist will be necessary in the very near future.

The Imperial Air Transport Company will not be concerned in the making of such aeroplanes. But they will be in a position very profoundly to influence technical progress in the design of civilian aircraft in the next few years. It is to be hoped that they will use their power wisely and that they will recognise that the time is as yet far from ripe for the standardisation of commercial aircraft.

Those who will be responsible for ground and traffic organisation will naturally prefer to have to deal with the minimum possible number of types of aeroplanes and engines. If this very natural desire of the operational side of the concern for standardisation of design is given unlimited scope, the Company will fall short of its duty to the Nation and shareholders.

It should possess an experimental department quite detached from the regular operations staff, free within limits to try even apparently wild-cat schemes which seem to it to promise a desirable result. But if the Company does set up such a department let it go and look carefully at the Air Ministry's experimental departments—and then go and do otherwise.—W. H. S.

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1923.—(Part I)

By C. G. Grey.

The year 1923 deserves to be recorded as one of the remarkable years in the history of aviation, like 1909 because we then saw the first real flying in this country and 1911 because of the great cross-country flights and 1914 because of the outstanding development in Service aircraft before the outbreak of war and 1917 because of the appearance of a whole group of wonderful war machines and 1920 because of the organisation of air-line work.

The remarkable features of 1923 have been (*a*) The proof in Iraq by the Royal Air Force of the doctrine of "Control without occupation" as enunciated by our Air Minister, Sir Samuel Hoare, (*b*) The proof by our civil aircraft companies that air lines and air-taxi services can be run regularly and efficiently and (*c*) The proof by our designers in their light aeroplanes that a man can fly fast and safely with about ten horse-power instead of the hundred or so horse-power which had come to be considered necessary during the War 1914-18. Thus in Service, Civil and Technical Aviation 1923 has shown us the opening of new epochs in flying in each of the three sections of the science. In many other ways within each of these sections steady progress has been made.

Perhaps the progress has not been so great as it might have been if everybody concerned with flying had acted with the celerity necessary to satisfy the traditional young man in a hurry. But greater hurry would certainly have produced greater mistakes, and faith in our future should be all the greater because our progress towards our ambitions is sure if slow. It is always the very young with all their life before them who find waiting most difficult.

Long range strategy is more certain to gain its ends than are rush tactics. It is true that the person who never makes mistakes never makes anything else, but the aviator who is remarkable for his skill in getting out of a tight corner is never so safe as the one who never gets into a dangerous spot. There is much to be said for the old tag *festina lente*, which may be freely translated as "Softly softly catchee monkey."

Service Aviation.

So far as the Royal Air Force is concerned excellent progress has been made, and the credit for it must go to the Chief of the Air Staff, Air Chief Marshal Sir Hugh Trenchard. It is said that the time always finds the man, and because Air Power is now the first necessity to the British Empire the man has been found for us. Sir Hugh built the R.F.C. out of nothing after the outbreak of war in 1914. He organised victory in the field in 1916-17. He made the first purely air war with his Independent Force R.A.F. in 1918. And in the succeeding five years of devastating peace (a year longer than the duration of the so-called Great World War) he has built up our new First Line of Defence. Also he has by sheer courage and faith in his cause defeated a prolonged and bitter campaign by the Admiralty to break up the Air Ministry and destroy the Air Force in the imagined interests of the Navy.

It has been said by enemies that Sir Hugh Trenchard is no staff officer. He would himself be the last person to claim that distinction. But he is a great leader of men who has the gift of inspiring others to work out the vast schemes which he has conceived. And he may best be judged by his works. To-day we have the strongest and best trained and most experienced air force in the World. We have the best war aircraft in the World. And the plans which have been laid down for future developments assure to us the continuance of our position as the leading Air Power of the World. For this we have to thank Sir Hugh Trenchard.

We have been fortunate in 1923 in having as Secretary of State for Air Sir Samuel Hoare, a man of unimpeachable integrity, of wide business experience, and of outstanding intelligence, who has also the advantage of having served with distinction in real war. Sir Samuel has supported loyally and with marked ability in Parliament and in the Cabinet (of which he became a member in May) the schemes of the Air Staff, and he has won the respect and personal regard of all who have had to do with him. And in the Duke of Sutherland we have had an under-Secretary for Air who has been equally successful in such work as has fallen to him.

The R.A.F. Reserve.

The first noteworthy Service matter of 1923 was the announcement in February of the scheme for the formation of an R.A.F. Reserve of Officers. By the end of the year training schools run by civilian firms to give refresher courses to Reserve pilots were in full swing at the De Havilland aerodrome at Stag Lane, Edgware, for the London area, at the Armstrong-Whitworth aerodrome at Coventry for the Midlands, at the Bristol Company's aerodrome at Filton for the West Country, and at the Beardmore aerodrome at Renfrew for Scotland. All have done so well that the output of "refreshed" pilots has exceeded expectations and to-day an extra two hundred pilots are needed.

The Air Force Estimates presented to Parliament on Mar. 8 showed a generous increase over the previous year and quite a handsome allowance for expenditure on new aeroplanes, engines and other matériel. It was the fault of the technical side of the Air Ministry and not of the Air Staff that much of the money voted for new machines still remains unspent and will probably have to be returned to the Treasury. Those members of Parliament who concern themselves with and are concerned for our Air Power will no doubt demand explanations in due course.

The Iraq Command.

A noteworthy event was signified in the King's Birthday Honours List in June, when Sir John Salmond, Air Officer Commanding in Iraq, was promoted to Air Marshal, thus giving him rank equivalent to that of Lieutenant-General in the Army and by inference raising the status of the Air Force in Iraq from that of a Division to that of an Army Corps. Sir John has the distinction of being the first Air Force officer to command an army of occupation (one does not forget the conquest of Somaliland by Group Captain Robert Gordon in command of a mixed force of Navy, Army, R.A.F., and native levies) and to administer the country.

His command in Iraq has been as remarkably successful as was his command of the R.A.F. in France in 1918. He has controlled the country with the Air Force and the occupying army is gradually diminishing in size and importance. He has won the regard of all who have served with or under him. Even the youngest and least reverent of flying officers are enthusiastic about Sir John's high sense of justice in dealing with delinquents and his fine sportsmanship when off duty. And squadron leaders and other unit commanders are no less enthusiastic over the way in which Sir John and the Staff backed them through thick and thin in all their demands for personnel and matériel. If ever there was a happy command it has been Iraq in 1923.

It has just been announced that Sir John Salmond is returning to England and is handing over the command to Air Vice-Marshal J. F. A. Higgins. Also it was announced recently that Sir John had become engaged to the Honourable Monica Grenfell daughter of the Earl of Desborough. Everybody in the Air Force will wish him and his bride-to-be long life and that same happy fortune which has followed him through his Service career.

It may be that on his return he will be appointed to command the Home Defence Force, as distinct from the Inland and Coastal Areas.

Certainly no more satisfactory successor to Sir John Salmond could be found than Air Vice-Marshal Higgins who has always been entirely successful as a commanding officer while at the same time inspiring a peculiarly personal affection among those under him. His departure from the command of the Inland Area will be the cause of very sincere regret, though all will rejoice at the opportunity which is now afforded to him of winning further distinction.

Cadet College Changes.

Another change during 1923 which calls for comment has been that of the Commandant at the R.A.F. Cadet College at Cranwell. Air Commodore Charles Longcroft, who founded and organised the College handed over to Air Commodore A. C. Borton who was Sir John Salmond's Chief of Staff in Iraq. Both officers have that quality of inspiring respect and personal regard which is the highest form of popularity. So much attached were the staff and personnel at Cranwell to Air Commodore Longcroft that the station nearly went into mourning at his departure. But after a short period under his successor Cranwell has resumed its happy atmosphere and has discovered that it is possible for Fate to grant a succession of benevolent despots—on the principle that a benevolent despotism is the ideal form of government.

Air Commodore Longcroft has since been "lent" to the Coastal Area, and without having any knowledge of the future plans of the Air Staff one hazards a guess that the "loan" was for the purpose of initiating him into the mysteries of Area organisation and administration so that in the near future he may take over the command of the Inland Area. Should that be so the appointment will give general satisfaction. Air Commodore Borton distinguished himself highly in Iraq when it was still known as Mesopotamia. Also he did brilliant work under Sir Geoffrey Salmond in Palestine during the War 1914-18. And in both areas he proved himself to be an exceptionally gifted leader of men. He and Air Commodore Longcroft are both very young men for the rank and commands which they have held and it is only reasonable to expect great futures for both of them in the forthcoming war against the Yellow Races.

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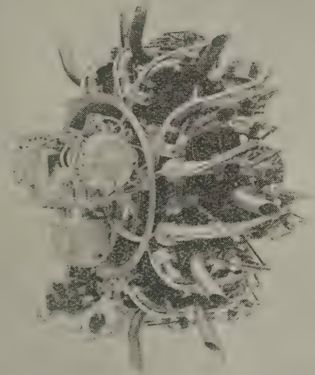

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Personnel and Supply.

A notable addition to the Air Council was made in 1923 when Air Vice Marshal Philip Game was appointed Air Member for Personnel, a post which corresponds to that of Adjutant-General in the Army. He was lent to R.F.C. Headquarters in France during the War 1914-18 to organise the staff work when the R.F.C. suddenly outgrew its existing primitive organisation. There is a legend that he arrived bearing a chit from Sir Douglas Haig to Sir Hugh Trenchard saying merely "Herewith my best staff officer. Do what you like with him." Since then he has spent his time re-organising. His most recent achievement has been the straightening of the appalling muddle into which the R.A.F. had fallen in India since the outbreak of Peace. Certainly nobody could be better fitted to handle the organisation of personnel under the new schemes for the expansion of the R.A.F. and the formation of the Reserve and the institution of the promised Territorial Air Force.

During 1923 the Supply side of the R.A.F. has been handled capably and earnestly by Sir Geoffrey Salmond, Air Member for Supply and Research on the Air Council, a post corresponding to that of Quartermaster-General in the Army. If the money voted by Parliament for new material has not been spent it is not Sir Geoffrey's fault for none could be more anxious than he to provide adequate equipment to the fighting squadrons and training stations. During his command of the Middle East Area in the War 1914-18 he was always notable for his ability to extract new machines from a reluctant Supply Department in England, and as a practising aviator of long experience none knows better the needs of pilots.

Such delay in placing orders as has occurred can only be ascribed to his technical subordinates (as explained by Captain Sayers in his article elsewhere in this paper) and it is not possible for any chief of a department to dismiss his subordinates wholesale. Time is necessary for their faults to be discovered and still more time is necessary to trace those faults to the people who are responsible. And we make look for a fairly wholesale comb-out in 1924. At any rate it is to Sir Geoffrey's credit that though other countries may have faster aeroplanes and more of them than we have there is no doubt that for purely war purposes we have the best, and that in case of war our best machines can be produced in quantities at very short notice.

The Sea-Going Side.

Also it has happened that for political reasons most of our new machines have been designed for the Fleet Air Arm, so that the Navy in its agitation for a separate Naval air service cannot plead that it has been neglected by the Air Ministry. Consequently the equipment of the fighting squadrons in India and Iraq and the Flying Training Stations at home has consisted almost entirely of re-conditioned war-time machines of 1916-17 design or earlier, while our aircraft-carrier ships and Fleet co-operation stations ashore have been full and over-full of the latest deck-flying fighters, fleet-spotters, torpedo-carriers, bombers, amphibians and float-seaplanes. In fact our Fleet Air Arm is not only equipped with better types of machines than is any Naval Air Service in the World but we have more naval aircraft in serviceable condition than have all the other nations put together. And for this the British Navy at any rate may thank Sir Geoffrey Salmond.

The credit for the extraordinarily high efficiency of the Fleet Air Arm both as concerns the personnel and the types of machines evolved is due to the Coastal Area R.A.F. which under the benign command of Air Vice-Marshal Sir Arthur Vyvyan has reached a pitch of perfection never approached by any Naval air service. Air Vice-Marshal Vyvyan is about the only senior Naval officer who has ever understood Naval aviation as it should be, and his work at the Coastal Area is a monument of what can be done by sympathy and enthusiasm. For some time past there have been rumours that Sir Arthur is to retire from the R.A.F. Should he do so it will be a calamity for the Air Force, for nobody yet has combined to such a degree the best qualities of a Naval officer with the ability to co-operate sincerely with the predominating Army element in the R.A.F. All will hope that he will yet see many years of service in that branch of aviation which he has placed on such a firm footing during 1923.

The Air Force in General.

One of the greatest successes of 1923 has been the R.A.F. Staff College. The formation of this establishment by the Air Staff was severely criticised in many quarters on the grounds that all the staff training required by R.A.F. officers could be had at the Staff College at Camberley or at the Naval Staff College at Greenwich. Happily the organisation at Andover was placed in the hands of Air-Commodore, now Air Vice-Marshal, Brooke-Popham, one of the first of our military aviators, who being one of the most modest of men accepted the appointment unwillingly and proceeded to make the same solid success of the job that he did as Quarter-Master General to the R.F.C. during the War and as Director of Research at the Air Ministry after the War.

The whole spirit of the R.A.F. Staff College is exactly what it should be. The officers passed out of the first course, and those of the second course which is now at work, have been most skilfully selected and they are remarkable for the energy which they put into work and play alike. Those of the first course are already doing excellent work in various appointments and the second course promises to be every bit as brilliant as the first.

As to the R.A.F. in general, the Royal Air Force Pageant at Hendon on June 30 and various displays since then by Service pilots, such as that before the Prime Ministers of the Over-Seas Dominions at Croydon, have shown that the quality of our aviators has in no wise deteriorated as regards mere skill. And the work done over the mountains of the North-West Frontier of India, over the deserts of Iraq and the hills of Kurdistan, and over the fearsome country in Anatolian Turkey, when "peacifying" Constantinople, has proved that the pluck and endurance of the personnel is maintained at the highest war-time standard.

Despite attacks by newspapers whose proprietors happen to have personal grudges against the Chief of the Air Staff or against the Prime Minister the esteem in which the Air Force is held by the Great British Public is steadily augumenting. People are awaking to the fact that the Air Force is in fact our First Line of Defence, and the younger generation both male and female who missed the full benefits of the War 1914-18 are taking an intelligent interest in the Air Force which will one believes be much to their benefit when called to take a hand in the forthcoming war.

To this appreciation of the R.A.F. the "other ranks" of the Air Force have greatly contributed by their smartness and splendid march-discipline on ceremonial occasions and by their good behaviour and neatness when off duty and among the civilian population. The excellent training of recruits at the Depot at Uxbridge and of the aircraft apprentices at Cranwell and Halton is chiefly responsible for this. Even allowing for the fact that the R.A.F. insists on having a socially better class of recruit than do the Senior Services the credit for the result must go to the non-commissioned officers of the Old Army who laid the foundations and built the traditions of the R.F.C. which have been transmitted to the R.A.F., much as Kipling's "Sergeant What's His Name" made soldiers out of the Egyptian fellahin. From our old Guardee drill-sergeants up to the Chief of the Air Staff the R.A.F. deserves the thanks of the British Nation for its work in 1923.

(To be continued.)

ANOTHER FRANCO-GERMAN AIRSHIP.—The French Airship Mediterranée (originally the German passenger Zeppelin Nordstern) outside the shed at Cuers-Pierrefeu which was the starting-point of the ill-fated voyage of the Dixmude.

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THE IMPERIAL AIR TRANSPORT COMPANY.

On Dec. 28, 1923, the Air Ministry issued the text of the agreement between the President of the Air Council and the British Foreign and Colonial Corporation Ltd. providing for the formation of a firm to be called the Imperial Air Transport Co. Ltd. This is a firm which since its institution was first rumoured has been commonly known as the Million Pound Monopoly Company.

According to the official document the object of the I.A.T. Co. is to operate a heavier-than-air transport service in Europe including the Mediterranean and the Black Sea—from which it may be deduced that an air trade agreement with the Union of Soviet Republics, otherwise Bolshevik Russia, is contemplated. The agreement deals only with heavier-than-air transport and guarantees that no subsidy shall be given to any heavier-than-air transport firm other than the I.A.T. Co. The right to subsidise lighter-than-air transport lines is expressly reserved.

The initial share capital of the Company will be one million shares of £1 each and the British Foreign and Colonial Corporation Ltd. guarantee the subscription of half the shares.

The first object is the acquisition of the businesses of Handley Page Transport Ltd., the Instone Air Line Ltd., the Daimler Airway (branch of Daimler Hire Ltd.), and the British Marine Air Navigation Co. Ltd (allied to the Supermarine Company of Southampton).

The agreement is signed on behalf of the B.F. & C. Corporation by the Lord Hindlip and Lt.-Col. Brinsley Fitzgerald. Under the agreement the Company must be formed by Apr. 1 next and the existing transport companies must be acquired or equivalent services established by that date.

The Government guarantees a subsidy of one million pounds to be spread over ten years. For the first four years the Treasury is to give a subsidy of £137,000 per annum subject to a minimum yearly mileage of 1,000,000. In the fifth year the subsidy will be £112,000, in the sixth year £100,000, in the seventh £86,000, in the eighth £70,000, in the ninth £52,000, and the tenth £32,000.

The profits of the Company (if any) are to be distributed thus :—(a) 10 per cent. on the paid-up capital to the shareholders; (b) One-third of the balance for the repayment of the subsidy, one-third for the development and improvement of the service and of British civil air transport and the remainder for the shareholders.

The services are to be continued until the subsidy has been completely repaid. Further services may be operated and agreements made with foreign companies.

The aircraft used are to be British-built and registered in Great Britain. The pilots employed are to be enrolled in the Royal Air Force Reserve or the Auxiliary Air Force and the technical and administrative personnel are to be British subjects or subjects of British Protectorates or mandated territories. All the directors and shareholders of the I.A.T. Co. must be British subjects and the Secretary of State for Air shall nominate on behalf of the Government two directors who shall not be required to hold qualification shares.

In acquiring the existing air lines the cash price for the purchase is not to exceed a third of the whole price. This cash and the initial working capital is to be secured by means of ten shillings per share payable on application and allotment of the first 500,000 shares issued. The remaining two-thirds of the purchase price will be paid by the allotment of fully paid shares in the I.A.T. Co.

The Company may apply to the Governments of British Dominions, colonies or foreign countries or companies for financial or other assistance in establishing air services and may receive subsidies in connection with these.

All aircraft aerodromes and bases of the Company shall be available for the Government in a national emergency.

The rates of wages, hours and conditions for the workpeople are safeguarded under the agreement.

The Company agrees to test experimental types of commercial aircraft which have passed their tests at the Government establishments and to carry out at cost price such experimental work as the Government wishes.

Construction and repair of machines is to be carried out in British territory by British manufacturers. But with the leave of the President of the Air Council orders may be placed elsewhere if British manufacturers refuse reasonable data as to costs.

The Company agrees to allow a rebate of 10 per cent. on the advertised fares to officials of His Majesty's Government, including members of the fighting and civil services, when travelling on duty.

Provision is made for the fitting of all the Company's aircraft with such safety apparatus as may be considered necessary.

Copies of the complete document may be obtained from His Majesty's Stationery Office or through any bookseller.

All these provisions appear to be perfectly reasonable. The only clause about which there seems to be any doubt is that concerning the repayment of the subsidy to the Government. It requires the mind of a confirmed optimist to believe that a concern of this kind can begin to pay its way within the next ten years. But it is certain that the firm will do a very great deal to develop civil aviation and air transport and the thanks of the Empire are due primarily to Mr. Holt Thomas who induced Mr. Szarvasy to influence the British Foreign & Colonial Corporation to find the half-million pound capital immediately necessary.

Unless some very startling enlightenment comes in the course of the next two or three years to the travelling public and to the directorate of the I.A.T. Co. and to the designers of aeroplanes and aero engines it is very unlikely that any profit will be shown for many years to come. It is much more likely that a firm run on the lines of the De Havilland Hire Service under personal direction and with minute attention to economy in detail will begin to pay its way comfortably while the Government is still hoping for the return of some of the subsidy.

At the same time there is no doubt that a big financial effort of this kind is necessary in order to do the development work of civil air transport during the next few years and as such the Imperial Air Transport Company deserves the wholehearted support of everybody concerned with aviation.—C. G. G.

The Loss of the Dixmude.

On Dec. 18 the French rigid airship *Dixmude,* formerly the German Zeppelin L.72, left Cuers-Pierrefeu near Toulon for an extended tour over Algeria and a portion of the Sahara. She had on board 52 officers and men including five officers of the French Naval General Staff.

At 19.30 hours she was seen over Tunis and at 16.20 hours on the 19th she passed over M'Salah, 500 miles south of Tunis and then turned north. On the 20th she was signalled at about 50 miles south of Biskra.

Here news of very bad weather in the Mediterranean was communicated to the commanding officer, Naval Lieut. du Plessis de Grenedan, who immediately changed the course of the airship eastward towards the Tunisian border.

Throughout the whole of the following day she fought against the gale and from time to time got into communication with various wireless stations in Tunis and Algeria. On Friday evening a message stated that her stock of petrol was nearly exhausted and that she would be obliged to land on the following morning. At 02.00 hours on Dec. 22 a wireless message stated that she was still holding her own against a furious gale, but that her petrol had nearly run out and that two of the crew were ill.

At 15.30 hours a final wireless message was received from the airship by the wireless post at Medenine in which the commander stated that he was searching for a landing place.

From then on various conflicting statements were circulated stating that the airship had been seen in various parts of North Africa.

One fact that was definitely known was that the *Dixmude* had on board sufficient petrol for a flight of 115 hours and that on Dec. 23 at 01.00 hours this supply would have been exhausted under normal conditions.

Cruisers, destroyers, and various other craft were sent to search the adjacent coast of the Gulf of Gabes, a point where the airship was likely to be found judging from her last-known position and the direction of the wind.

In view of the various rumours reporting her to be seen in inaccessible places in Algeria and Tunis, aeroplanes were despatched from the various French air stations in North Africa to maintain a continual search.

On Dec. 28 Italian fishermen found in their nets the body of Lieut. du Plessis de Grenedan off the coast of Sicily near the port of Sciacca 120 miles from the African coast, but barring the finding of some wire also in the same locality, nothing further has been found of the airship.

On Dec. 29 an official report was issued from Rome stating that there was reason to believe that the *Dixmude* fell into the sea on the night of Dec. 21-22 seven miles off the Sicilian coast near Cape San Marco.

An official at Sciacca states that at about 02.30 hours on Dec. 22, the time at which the dead commander's watch had stopped, the sea and sky were lit up suddenly by a glare and this is confirmed by several villagers.

One can only conclude that the *Dixmude* was lost at sea, but whether by fire or not may never be decided.

It is understood that the Ministry of Marine are being criticised for allowing the airship to proceed on such a long flight during a period when it is known that the weather conditions in the Mediterranean and North Africa are totally unsuitable for such flights. Whether this be justified or not remains to be seen.

Where the Ministry of Marine has been at fault is in not providing mooring masts. Had these been installed in North Africa such a disaster would never have happened. To have attempted to operate an airship of the size of the *Dixmude* without proper equipment and with so little practical experience does a very great injustice to all concerned with airships and their future. The present disaster has caused untold moral damage which will take the airship world some time to recover.

His Majesty the King has sent the following message of sympathy to the President of the French Republic :—

> " Fearing from the latest information available that it is unfortunately all too probable that the airship *Dixmude* has met with disaster, I ask you, M. le President, to accept

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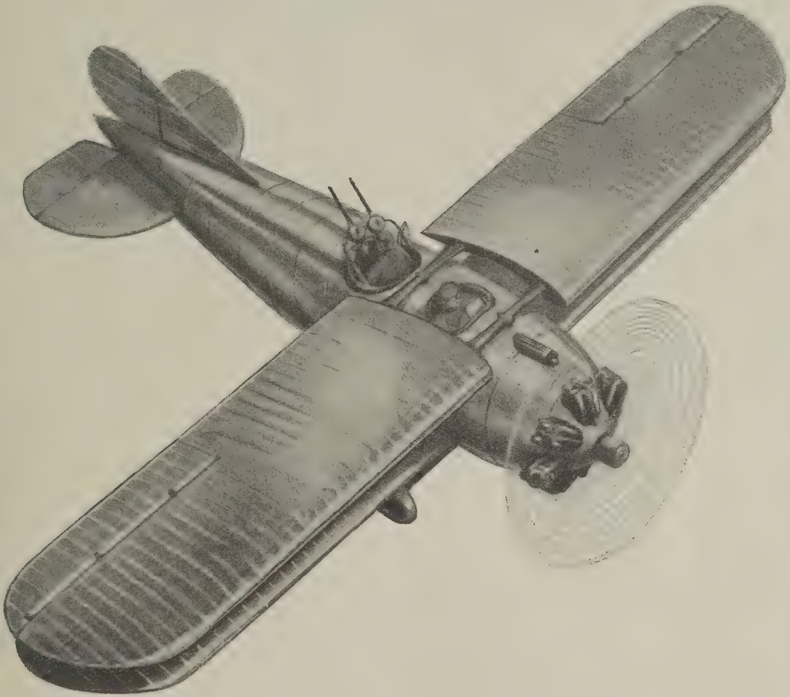

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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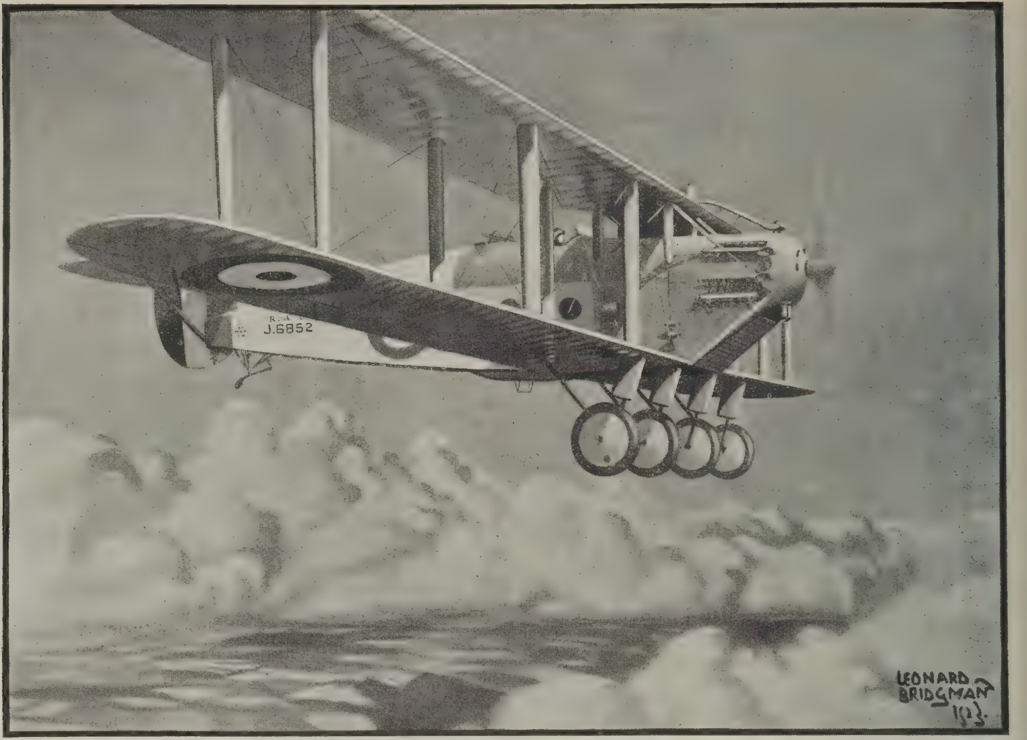

THE LEVIATHAN.—A drawing by Mr. Leonard Bridgman of the Avro-Napier with 1,000 h.p. Napier Cub engine. This leviathan of the air is the biggest single-engined machine in the World and is a good deal more stable and controllable than the German-American monstrosity the sea-going Leviathan (ex Vaterland).

in the name of the French nation the deepest sympathy which I offer on behalf of the whole Empire in the loss of so many gallant men whose untimely fate is deplored here no less than in their own country."

This message of condolence adequately reflects the feelings of all concerned with aircraft throughout the World.

Rotterdam to Paris on a Light Aeroplane.

On Dec. 18 M. Raparlier, a Belgian pilot, flew from Rotterdam to Paris on a Carley light aeroplane fitted with a 25 h.p. Anzani engine. He left Rotterdam aerodrome at 11.20 hours and landed at Haren aerodrome, Brussels, at 12.05 hours. He left again at 13.17 hours in heavy rain and in a wind of 20 m.p.h. and landed just short of Le Bourgêt aerodrome owing to lack of petrol. Quickly filling up he hopped the odd 600 yards on to the aerodrome landing there at 16.30 hours.

In spite of the unfavourable weather he covered the 400 kilometres (250 miles) from Rotterdam to Paris in four hours flying time.

On the following day M. Raparlier demonstrated the Carley monoplane at Le Bourgêt and later on it will proceed to Villacoublay to be demonstrated before the Section Technique.

The Carley light monoplane is designed and built by Mr. J. D. Carley a very early Dutch pilot and designer, who has previously built various school monoplanes of higher horse-power.

The Carley machine is a small cantilever monoplane of 27 ft. 7 ins. span. The wing, which is tapered in thickness, rests on the top longeron of the fuselage, which is triangular in section, and the undercarriage reminds one of the R.A.E. Club's "Hurricane" with the exception that the axle instead of being a spring consists of two steel tubes hinged at the bottom point of the fuselage, the outer ends of which are suspended on rubber on two steel tube Vees the upper ends of which are attached to the top fuselage longerons at points where the wing-spars are attached.

It is reported that the Carley monoplane will return to Rotterdam via London.

An International Combine.

Some confusion seems to exist in the Aircraft Industry as to the difference between the designs of machines turned out by the ancient firm of Blériot Aéronautique at Suresnes near Paris. It will be remembered that the Spad Company was originally formed to carry on the work of the Deperdussin Company. When M. Deperdussin went to prison M. Blériot purchased the business in order to develop the designs of M. Bêchéreau, the Deperdussin designer, and the Spad initials stood for Société pour les Appareils Deperdussin. Later the initials were explained as indicating Société pour Aviation et ses Dérives.

During the war practically the whole strength of the Blériot factories was turned on to producing Spads and when M. Bêchéreau left the firm he was replaced by M. Herbemont who has been responsible for all the Spads with the familiar whale-like fuselages.

More recently Blériot Aéronautique has begun to produce a series of designs entirely distinct from the Spad-Herbemont series. These Blériot designs are produced by M. Kirste who during the war was the designer of the Austrian Phönix aeroplanes. Though the Phönix was rather late in making a name for itself during the war, chiefly owing to the fact that the Austrians had practically no aircraft factories at the beginning of the war and were dependent largely on German machines, there is no doubt that by the end of the war the Phönix was one of the best machines used by any of the belligerents. Its qualities have been recognised by several countries and the Swedish Military Air Force to-day is largely equipped either with actual Phönix machines or with direct descendants of the Phönix.

One gathers that the French Government have issued a special permit to M. Kirste, a former enemy alien, to live and work in France, and M. Blériot is to be congratulated on showing such an open mind as to engage an enemy designer to improve French aircraft designs, which as the last Paris show demonstrated were distinctly running to seed.

The Iraq Command.

The Air Ministry has issued the following statement dated Dec. 28 :—

> It is notified for information that Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., Air Officer Commanding, Inland Area, R.A.F., will succeed Air Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., as Air Officer Commanding H.M. Forces in Iraq, from April next. Air Vice-Marshal Higgins will leave this country for Iraq in February.
>
> An announcement will be issued later of other appointments to the higher commands of the R.A.F. consequent upon the present intimation.

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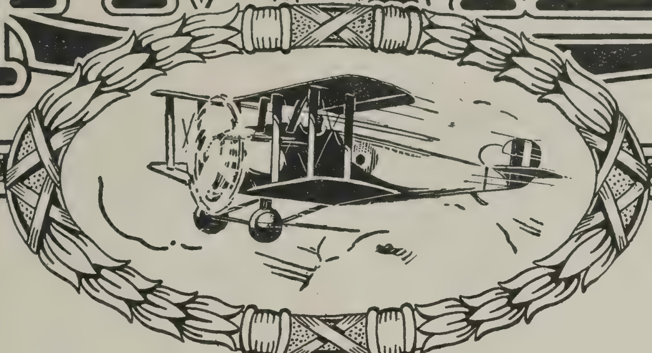

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THE ROYAL AIR FORCE.

London Gazette.

Dec. 18.

General Duties Branch.—The follg. are granted perm. commns. as Flt. Lts. (Dec. 19):—R. A. de H. Haig, J. W. Jones, A. D. Pryor.

Stores Branch.—Flg. Off. E. K. Greenhow, M.C., is granted a perm. commn. in the rank stated for accountant duties (Dec. 19).

Medical Branch.—W. Parsons is granted a S.S. commn. as a Flt. Lt., with effect from, and with seny. of, Dec. 3. Flt. Lt. O. Arner relinquishes his temp. commn. on ceasing to be empld. (Nov. 30).

Reserve of Air Force Officers.—The follg. Offs. are confirmed in rank, with effect from the dates indicated:—Flying Officers:—A. E. Francis (Nov. 22); A. M. Alexander, A.F.C., G. Colledge (Nov. 29). Pilot Officers:—R. C. Knowles (Oct. 20); R R. H. Taylor (Nov. 1); T. P. Jenkins (Nov. 22); C. W. Calder (Nov. 27); J. E. Taylor, W. A. Warwick (Nov. 29); J. F. Turpie (Nov. 30).

Dec. 21.

Stores Branch.—The follg. Flg. Offs on probation are confirmed in rank:—H. A. Lotherington, E. G. Joliffe.

Dec. 28.

General Duties Branch.—The follg. are granted permanent commns. in the ranks stated (Dec. 29):—Flt. Lt. C. B. Dalison, A.F.C. Flg. Off. R B. Sutherland, D.F.C.

A. G. Hill is granted a short service commn. as a Flg. Off. with effect from, and with sen of, Dec. 13.

The follg. Plt. Offs. are promoted to the rank of Flg. Off. (June 20):—R. D. Whelan, J. G. Hawtrey. Flg. Off. F. W. Sinclair is placed on half pay, Scale B (Dec. 26). Plt. Off C. H. S. Buckmaster resigns his S.S. commn. (Dec. 20). Flg. Off E. C. B. Wright relinquishes his S.S. commn. on account of ill-health and is permitted to retain the rank of Flg. Off. (Dec 29).

Stores Branch.—Flg. Off. R. C. Clayton is granted a perm. commn. for accountant duties (Dec. 29). Plt. Off. R. W. L. Glenn is promoted to the rank of Flg. Off. (July 11, 1922)

Medical Branch.—Flg. Off. G. Kinneir is promoted to the rank of Flt. Lt. (Dec. 19).

Reserve of Air Force Officers.—The following officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs. W. E. L. Courtney (Oct. 20); B. A. Hewett (Nov 1); P. F. Dawson (Nov. 29), C. T. Travers, A.F.C. (Nov. 30); G. H. Rogers (Dec. 1); H. Hemming, A.F.C. (Dec. 4); W. D. Thom, D.F.C. (Dec. 6); H. A. Francis, A.F.C. (Dec. 11); C. Duttson, A. C. Ferguson, T. A. Gladstone, A.F.C., A. R. MacDonald, E. D. Salthouse, W. H. Whitlock (Dec 19).

Plt. Offs. J. C. Raine, M.B.E., (Dec. 1); H. C. Biard, H. W. B. Hansford, A. Lewis (Dec. 19).

Flg. Off. G. H. Bittles is transferred from Class A to Class C (Dec. 13).

Appointments.

Week ending Dec. 31.

General Duties Branch.—Wing Commander R. C. M. Pink, C.B.E., to No. 1 Wing H.Q., India, pending taking over command, 23/11.

Squadron Leaders F. E. Sandford, A.F.C., to No. 4 F.T.S., Egypt, 28/11; R. G. Parry, D.S.O., to H.Q., Egypt, 28/11.

Flight Lieutenants G. Y. Tyrrell, M.C., to No. 47 Sqdrn., Egypt, 6/12; P. G. Scott, to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab., 28/11; E. J. Protheroe and L. P. Hirsh, to School of Balloon Training, Larkhill, for course of instruction, 14/1; H. J. Edgar, to R.A.F. Depot, 1/1; A. F. Quinlan, to School of Army Co-operation, Old Sarum, 5/1.

Flying Officers C. T. Walkington, to R.A.F. Base, Gosport, 28/12, E. Brewerton, D.F.C., to R.A.F. Base, Gosport, 1/1; S. W. Smith, to Night Flying Flight, Biggin Hill, 17/1; A. T. S. Leguen de Lacroix and H. Aldridge, to Aden Flight, Egypt, 5/12; J. B. V. Glyde, to No. 31 Sqdn, India, 19/11; A. H. Love, to No. 208 Sqdn, Egypt, 1/10; (Hon. Flt. Lt.) A. J. Carlielle, to No. 60 Sqdn., India, 29/11; G. N. Coward, to No. 2 F.T.S., Duxford, 28/12; P. J. Hayes, A.F.C., to R.A.F. Base, Calshot, 27/12; L. D. Stewart, to C. & M. Party, Cattewater, 3/1; P. J. R. King, to No. 22 Sqdn., Martlesham Heath, 1/1.

Pilot Officers T. A. Verney-Cave and J. C. Savory, to No. 56 Sqdn., Biggin Hill, 19/12; O. R. Pigott, to No. 7 Sqdn., Bircham Newton, 1/1; C. J. Pooley and W. P. Wiltshire, to Aircraft Park, India, 19/11; H. S. C. Bassett and H. C. E. C. P. Dalrymple, to School of Balloon Training, Larkhill, for course of instruction, 14/1; E. R. Newbigging, to No. 24 Sqdn., Kenley, 12/12.

Medical Branch.—Squadron Leader (Medical) T. J. Kelly, M.C., M.B., B.A., to H.Q., Iraq, 1/12.

Flight Lieutenants (Medical) M. Coghlan, M.B., to R.A.F. Depot, 11/1; J. J. Walsh, to No. 4 F.T.S., Egypt, 6/12; J. Prendergast, M.B., B.A., to No. 84 Sqdn., Iraq, instead of to Stores Depot as previously notified 18/2.

Stores and Accountants' Branch.—Squadron Leader (Stores) R. W. Thomas, O.B.E., to H.Q., Egpyt, 1/12.

Flight Lieutenants (Stores) T. G. Skeats, to Stores Depot, Egypt, 29/11; A. Jukes, M.B.E., to No. 5 Wing H.Q., Biggin Hill, 31/12; A. J. Redman, D.F.C., to C. & M. Party, Cattewater, 1/1; A. J. Cox, M.B.E., to No. 25 Sqdn., Hawkings, 4/10.

Flying Officers (Accountants) R. E. Steggall, to No. 4 Stores Depot, Ruislip, 14/1; E. C. M. Knott, to No. 56 Sqdn., Biggin Hill, 4/1.

The New Year Honours. Order of the Bath.

The promotions in, and appointments to, the Most Honourable Order of the Bath are as follows:—

Royal Air Force.—G.C.B. (Mily. Divn.).—Trenchard, Air Chief Marshal Sir Hugh Montague, Bt., K.C.B., D.S.O., A.D.C., R.A.F.

K.C.B. (Mily. Divn.).—Swann, Air Vice Marshal Oliver, C.B., C.B.E., R.A.F.

C.B. (Mily. Divn.).—Munro, Air Commodore David, C.I.E., M.B., M.A., F.R.C.S. (Edin.), R.A.F. Medical Services.

Awards and Promotions.

Air Ministry, Jan. 1.

The King has been pleased to approve of the following award to the undermentioned officer of the Royal Air Force:—Air Force Cross.—Flying Officer Basil Royston Carter.

The undermentioned officers are promoted to the ranks stated, with effect from Jan. 1:—

General Duties Branch.

Air Commodores to be Air Vice-Marshalls.—F. R. Scarlett, C.B. D.S.O., H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C.

Wing Commanders to be Group Captains.—W. F. MacNeece, C.B.E., D.S.O., D.F.C., C. F. Kilner, D.S.O.

Squadron Leaders to be Wing Commanders.—A. C. Winter, O.B.E., A. B. Gaskell, D.S.C., A. J. Miley, O.B.E., A. Corbett-Wilson, A. W. Tedder, E. H. Johnston, O.B.E., B. E. Sutton, D.S.O., O.B.E., M.C., W. R. Read, M.C., D.F.C., A.F.C.

Flight Lieutenants to be Squadron Leaders.—A. W. C. V. Parr, O. G. W. G. Lywood, O.B.E., T. G. Bowler, W. H. L. O'Neill, M.C., F. E. Hellyer, O.B.E., E. A. Beaulah, E. R. Vaisey, C. B. C. R. D. Oxland, R. C. Hardstaff, D. Iron, O.B.E., A. T. Williams, E. D. Atkinson, D.F.C., A.F.C., C. R. Cox, A.F.C., J. M. Robb, D.F.C., H. M. Probyn, D.S.O., R. F. S. Leslie, D.S.C., D.F.C., A.F.C., J. Leacroft, M.C., V. Greenwood, W. H. de W. Waller, A.F.C., L. H. Slatter, O.B.E., D.S.C., D.F.C., L. M. Bailey, A.F.C., T. E. B. Howe, A.F.C., S. R. Watkins, A.F.C., V. S. E. Lindop, W. H. Longton, D.F.C. A.F.C., H. P. Lale, D.S.O. D.F.C.

Flying Officers to be Flight Lieutenants.—E. S. Moulton-Barrett, R. A. Birkbeck, D.F.C., D. F. Fitz-Gibbon, D.S.C., A. B. Ellwood, D.S.C., C. C. Chapman, D.S.C., J. A. Boret, M.C., A.F.C., T. A. Warne-Browne, D.S.C., A. E. Dark, C. W. Busk, M.C., E. Burton, N. M. S. Russell, A. G. Jarvis, A.F.C., J. E. MacLennan, R. M. Foster, D.F.C., C. Crawford, P. H. Davy, W. H. Markham, H. T. Lydford, A.F.C., M. Burridge, C. E. Williamson-Jones, D.F.C., H. H. Down, A.F.C., L. C. Wynne-Tyson, F. C. B. Savile, F. Wright, C. G. Banting, A. M. Wray, M.C., A.F.C., J. Bussey, W. E. Swann, G. V. Howard, D.F.C., S. C. Harker, G. D. Daly, D.F.C., C. F. le Poer Trench, C. A. B. B. Wilcock, A.F.C., W. M. Yool, H. N. Hampton, D.F.C., F. L. Hopps, A.F.C., L. W. Jarvis, H. M. Moody, M.C., C. J. W. Hatcher, A.F.C., D. Price, S. H. Wallace, M.C., J. H. Bentham, R. L. Crofton, M.B.E., V. S. Parker, W. S. Watson, W. J. Seward, B. B. Caswell, E. L. Barrington, M.C., D.F.C., S. D. Culley, D.S.O., J. M. Fairweather, D.F.C., W. J. Daddo-Langlois, H. V. Robbins, S. C. Stratford, D.F.C., E. H. Richardson, J. R. I. Scambler, A.F.C., R. J. Rodwell, A. MacGregor, D.F.C., G. H. H. Scutt, M.C., J. W. Baker, M.C., H. R. Junor, D.F.C., F. J. Fogarty, H. W. Baggs, L. G. Harvey, A. L. A. Percy-Keene, E. P. Mackay, W. H. Poole, A.F.C., M.M., C. H. Stilwell, J. McFarlane, M.C., N. H. Jay, R. J. Reid, F. Thomasson, D.F.C., M.M., T. L. Lowe, H. Hackney, J. C. Foden, A.F.C., H. P. G. Leigh, D. L. Blackford.

Stores Branch.

Flight Lieutenants to be Squadron Leaders.—G. Stevens, O.B.E., F. G. M. Williams, J. S. Goggin, P. M. Brambleby, F. Grave, M.B.E. Flying Officers to be Flight Lieutenants.—G. A. Curtis, A. G. Knight, M.B.E., E. L. Ridley, J. Hobbs, L. E. Carter, D.C.M., C. E. Cullen, F. Whilton, D.C.M., L. H. Vernon.

Stores Branch Accountants.—Squadron Leaders to be Wing Commanders.—W. H. Holroyd, H. J. Down. Flying Officers to be Flight Lieutenants.—E. J. Grout, R. M. Grundy, H. W. Capener, R. F. C. Metcalfe, S. G. Linssen, E. C. M. Knott.

The Air Council.

The following Order in Council was published in *The London Gazette* of Dec. 21, 1923:—

(1) The Air Council shall consist of the following members, that is to say:—

One of His Majesty's Principal Secretaries of State who shall be President of the Air Council.

The Parliamentary Under-Secretary of State for Air.

The Chief of the Air Staff.

The Air Member for Personnel.

The Air Member for Supply and Research.

The Secretary of the Air Ministry.

(2) Of the members of the Air Council (other than the President) the Chief of the Air Staff shall be appointed by His Majesty and the other members shall be appointed by the Secretary of State.

(3) There may be included in the Air Council such additional members (if any) not exceeding two, as may be appointed by the Secretary of State.

(4) The Secretary of State is to be responsible to His Majesty and Parliament for all the business of the Air Council.

All business, other than business which the Secretary of State specially reserves to himself, is to be transacted in the following principal divisions:—

(*a*) The Parliamentary Under-Secretary of State for Air to be Vice-President of the Air Council and to be responsible to the Secretary of State for so much of the business of the Air Council, and in particular of that relating to Civil Aviation, as may be assigned to him from time to time by the Secretary of State.

(*b*) The Chief of the Air Staff to be the first and Senior Air Member of Council, and principal adviser of the Secretary of State in the direction of the Air Force, and in particular to be responsible to the Secretary of State for the administration of so much of the business relating to the disposition, command, employment, organisation, communications and works services of the Air Force, as may be assigned to him from time to time by the Secretary of State.

(*c*) The Air Member for Personnel to be responsible to the Secretary of State for the administration of so much of the business relating to the personnel, discipline and training of the Air Force as may be assigned to him from time to time by the Secretary of State.

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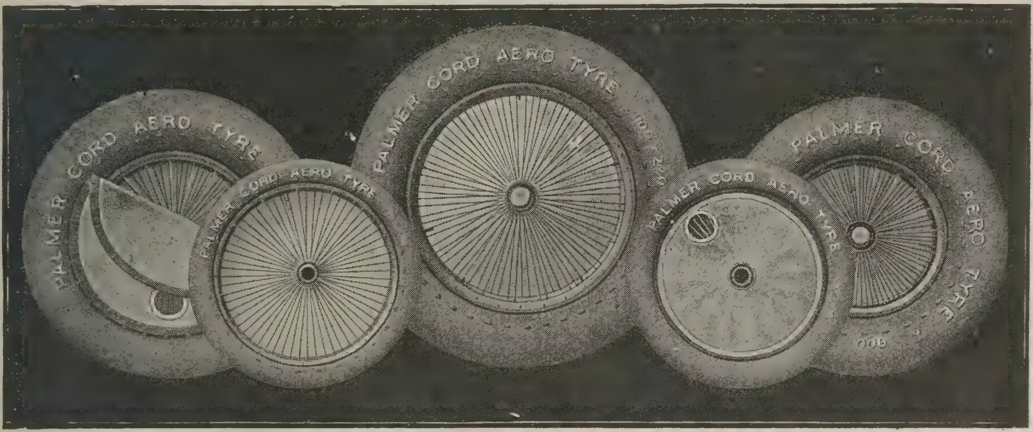

STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82*	185.	55.	135/50
,,	85*	185.	55.	Central
,,	36*	185.	55.	135/50
,,	40	185.	60.32	135/50
,,	152	185.	66.67	135/50
,,	163	185.	66.67	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60
,,	141	250.	80.	Central
,,	201	185.	60.32	125/60
1000×150	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 36, 40 and 163 are of stronger type than the other wheels for 800 × 150 tyres.*

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U/N/NN.

(*d*) The Air Member for Supply and Research to be responsible to the Secretary of State for so much of the business relating to the equipment, armament, maintenance and transport of the Air Force, and to aeronautical research and inspection both for the Air Force and for civil purposes, as may be assigned to him from time to time by the Secretary of State.

(*e*) The Secretary of the Air Ministry to be responsible to the Secretary of State for such duties discharged by the Air Ministry as are not assigned to other members of the Council, for the control of expenditure, and for the co-ordination of Air Ministry business; and to be also designated Secretary of the Air Council and as such charged with the preparation of all official communications of the Council.

(5) Subject to the foregoing provisions as to the transaction of business in separate divisions the powers and duties of the Air Council may be exercised and performed by any three of their number and notwithstanding that any office, the holder of which is a member of the Air Council, is temporarily vacant, provided however, that documents may be signed on behalf of the Air Council by any two members of the Air Council

(6) This Order in Council shall be substituted for the Order in Council dated July 14, 1922.

Honours in the Air Force.

The promotion of Sir Hugh Trenchard from K.C.B. to G.C.B. will be welcomed by everybody concerned with Service aviation as a recognition of the magnificent work which the Chief of the Air Staff has done in upholding the position of our new First Line of Defence during 1923.

The Knighthood conferred upon Air Vice-Marshal Oliver Swann will likewise give general satisfaction. As one of the very first naval aviators, and in fact the first British aviator to fly off British territorial waters in a seaplane, Sir Oliver is certainly a pioneer of Service aviation. He was associated with *Naval Airship No.* 1, commonly called the *Mayfly*. Thereafter he was a member of the first staff of the Air Department Admiralty under Capt. Murray Sueter, R.N. He served with notable distinction throughout the war and since the war he has continued to do most valuable work in his quiet unostentatious way.

Air Commodore Munroe as Chief of the R.A.F. Medical Service has organised his department in a way which thoroughly earned for him his C.B.

The promotion of Air Commodore Brooke-Popham to be Air Vice-Marshal is another well-earned reward to a pioneer of aviation. As a Captain in the Army Air Vice-Marshal Brooke-Popham was one of the first of our military aviators At the outbreak of war in 1914 he did the work of Quarter-Master General to the R.F.C. in the field and continued in that capacity under varying titles throughout the war. After the War he became Director of Research at the Air Ministry and instituted many valuable lines of work which produced far-reaching results. But his chief claim to distinction is that he founded and organised the R.A.F. Staff College at Andover which is now recognised as one of the most valuable assets of the Air Force.

Air Commodore Scarlett, also promoted to be Air Vice-Marshal, was a Captain R.N., joined the R.N.A.S. during the War, served throughout the War in numerous capacities and after the War was put in command of the training station for mechanics at Halton, where he has enhanced the local sporting reputation of the R.A.F. by his pertinacity as a hunting man.

R.A.F. Cadetship.

The following are declared by the Civil Service Commissioners to be the successful candidates at the competition held in November for admission to the R.A.F. Cadet College, Cranwell, but their admission is conditional on their having passed a medical examination. The names are given in order of merit

Holden, A. L., Hale, A. W. B., Leslie-Melville, A.R., Eyre, V. O., Ward, E. L. S., Pilcher, G. N., Steedman, E. B., Smith, P. de C., Webb, E. B., Clement-Parker, L St G. Merton W H Charnock, H W., Lowe-Holmes, P. W., Pearson-Rodgers, H. W., Bett, A. P., Shenton, R.F., Pike, T. G., Southey, H. F. G., Evans, J. F., Yonge, J V., Pearn, W. H., Ryley, D. W. R , Jackson, P. H.

The R.A.F. Reserve.

The Air Ministry announces that two new R.A.F. Reserve Training Centres are to be established in the North of England and that 200 pilots are required for the Reserve.

The 200 extra enrolments will be selected from those who served in the Flying Services during the war or who hold civil licences for flying commercial aircraft. Candidates who should not be, as a general rule, over 31 years of age, and who must enrol for a minimum of three years' service, will be interviewed by a Selection Committee and examined by a medical board either in London or at centres in the North.

Application forms and full information regarding the R.A.F. Reserve can be obtained from the Secretary, Air Ministry, Adastral House, Kingsway, London, W.C.2.

The existing training schools at Stag Lane, Bristol, Coventry and Glasgow do not cater for the large number of ex-pilots living in the North of England and in order to provide more accessible training centres north of the River Trent two new schools are to be opened. One will be at Brough on the Humber to be administered by the Blackburn Aeroplane and Motor Co. Ltd. Here, in addition to ordinary aeroplane training, owing to the aerodrome being equipped with seaplane hangars and slipways, seaplane instruction will also be given. The site of the other school has not yet been settled but it is understood that negotiations are proceeding between the Air Ministry and A. V. Roe and Co. Ltd. with a view to establishing a Reserve School on Alexandra Park aerodrome, Manchester.

The Martlesham Dinner.

The Annual Martlesham Heath Dinner will be held at the R.A.F. Club, 128, Piccadilly, W.1, at 7.30 p.m. on Feb. 1.

Tickets 15s. each exclusive of wines may be obtained from the P.M.C , R.A.F., Martlesham Heath, Suffolk, up to Jan. 14.

Gustave Eiffel.

On Thursday, Dec. 27, there died in Paris at an advanced age Alexandre Gustave Eiffel—known to the world at large as the designer of the Eiffel Tower, and to the Aeronautical World as a pioneer of Aerodynamic Research.

Yet neither the Eiffel Tower nor the Eiffel Aerodynamic Laboratory at Auteil can be regarded as representing any full measure of the ceaseless activity that marked Eiffel's long life.

Born at Dijon in 1832, Eiffel passed out with distinction from the Ecole Centrale des Arts et Manufactures in 1855, and was thereafter for some considerable period engaged in the construction and design of bridges and other civil engineering works. He was responsible for the design of the arches and roof trusses of the Galerie des Machines at the Paris International Exhibition of 1867, and in connection with this work he carried out a series of researches on the strength of metal girders which were published and which became a standard work on the subject in France.

He was thereafter responsible for many important civil engineering projects in all of which he displayed an extreme ingenuity combined with sound scientific design, and long before he undertook the construction of the Eiffel Tower (1887-89), the Eiffel Works at Levallois-Perret were among the most important of their class in France.

The Eiffel Tower—still by a long way the tallest building in existence—is in its way a remarkable engineering achievement, and it is of peculiar interest in that it was the scene of Eiffel's earliest experiments in aerodynamics.

Eiffel's interest in this subject arose from his bridge-building experiences, in connection with which he realised the necessity for more accurate data concerning the loads on large engineering structures and buildings caused by wind pressure. The Eiffel Tower provided him with the means of acquiring such data by a process of dropping bodies of various sizes and shapes down a wire slipway and measuring the terminal velocities thereof.

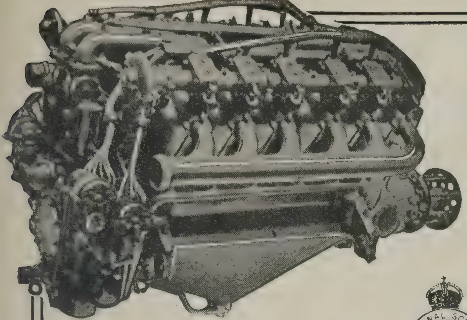
For similar reasons he was led to the study of meteorology, on which subject he published between 1892 and 1912 over a dozen large volumes.

The development of the aeroplane early led him to realise that measurements of air pressures on various bodies was necessary for other purposes than that of bridge-building, and by 1908 he had designed and built one of the first of the modern type of wind-tunnel laboratories at the Champ-de-Mars.

La Resistance de l'Air et Aviation, published in 1910, for the first time, provided the would-be designer of aeroplanes with reliable measurements of the wind forces on a selection of aeroplane wings, bodies, etc., and so made design a process not entirely dependent on guess-work.

The Champ-de-Mars laboratory speedily proved too small for the work which M. Eiffel's enthusiasm—and the growing public interest in aeronautics—led him to undertake and in 1912 the present Eiffel Laboratory was installed at Auteil. In 1920 M. Eiffel presented the Auteil Laboratory to the French Government

It is impossible to attempt to describe the aerodynamic work actually carried out by M. Eiffel or under his guidance. This brief record of his many activities should suffice to show that in him France has lost a man of a type unfortunately only too rare in all countries of the World. M. Eiffel was a scientific engineer of the highest professional standing—but he was more. He was one of those rare pioneers who have both the courage and the ability to carry their work through to success.—W. H. S.



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ROLLS-ROYCE "EAGLE VIII" AERO ENGINES.

We can supply from stock new Rolls-Royce Engines of the well-known "EAGLE VIII" and "FALCON III" types together with spare parts.

EXTRACT from letter we have received from HANDLEY PAGE TRANSPORT LIMITED, dated 5th December, 1923.

"EAGLE VIII" Engines.

"This type of engine is now used exclusively on our air services between London, Paris, Basle and Zurich.

In the period from the inception of the Handley Page Air Services in 1919 to the present date, 17,000 "EAGLE" engine hours have been flown, approximating 1,360,000 engine miles.

In the period October, 1922 to September, 1923, 5,070 hours were flown, representing 431,000 engine miles, with an engine efficiency percentage of 98.5.

We have now on our charge twenty-eight engines, and the total running time of these engines is 9,500 hours. Six of these engines have each over 500 hours to their credit, as follows, and are still in service:

ENGINE.	HOURS.
8E.3164	790
8E.3704	670
8E.3076	640
8E.2672	611
8E.5224	516
8E.3046	506

All the above flying hours have been carried out with engines supplied to ourselves by the Aircraft Disposal Company."

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89, KINGSWAY, LONDON, W.C.2.
Telegrams: "Airdisco, London."

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR WEEK ENDING DEC. 23.

Trips per Day.—Monday, 11; Tuesday, 11; Wednesday, 11; Thursday, 9; Friday, 8; Saturday, 0; Sunday, 1.

London—Paris—Zurich :
Handley Page Transport, Ltd., machines 10, passengers 51, freight 7,483 lbs.
London—Ostend—Cologne :
Instone Air Line, Ltd., machines 15; passengers 17; freight 14,180 lbs.
London—Rotterdam—Hanover—Berlin :
Daimler Airway, machines 9, passengers 11
Paris—London :
Air Union, machines 7, passengers 1, freight — lbs.
London—Rotterdam :
K.L.M., machines 10, passengers 7.
Special Machines : 0.
Total number of trips by British machines : 34, carrying 79 pas. Foreign machines : 17, carrying 8 passengers.
Comparative Figures :
For week ending Dec. 23 :
Machines, 51; Passengers, 87; Crews, 77; Total personnel, 164.
Corresponding week last year :
Machines, 52; Passengers, 168; Crews, 100; Total personnel, 268.
Corresponding week, 1921 :
Machines, 49; Passengers, 108; Crews, 73; Total personnel, 181.
Corresponding week, 1920 :
Machines, 19; Passengers, 9; Crews, 18; Total personnel, 27.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 2; Tuesday, 0; Wednesday, 0; Thursday, 0; Friday, 0; Saturday, 9; Sunday, 0.

London—Paris—Zurich :
Handley Page Transport, Ltd., machines 2, passengers 7, freight 2,065 lbs.
London—Ostend—Cologne :
Instone Air Line Ltd., machines 2, passengers 4, freight 2,726 lbs.
London—Rotterdam—Hanover—Berlin :
Daimler Airway, machines 2, passengers 1.
Paris—London :
Air Union, machines 1, passengers 4, freight — lbs.
London—Rotterdam :
K.L.M., machines 4, passengers 1.
Special Machines : 0.
Total number of trips by British machines : 6, carrying 12 pas. Foreign machines : 5, carrying 5 passengers.
Comparative Figures :
For week ending Dec. 30 :
Machines, 11; Passengers, 17; Crews, 16; Total personnel, 33.
Corresponding week last year :
Machines, 41; Passengers, 95; Crews, 81; Total personnel, 176.
Corresponding week, 1921 :
Machines, 30; Passengers, 49; Crews, 48; Total personnel, 97.
Corresponding week, 1920 :
Machines, 8; Passengers, 10; Crews, 10; Total personnel, 20.

[The Air Lines closed down from Dec. 24-28 for Christmas Holidays.]

Croydon Notes.

The events of the past fortnight at the aerodrome have been few and far between. The week Dec. 17-23 was fairly good considering everything. The Instone Line carried tons of turkeys and pounds of plum puddings to Cologne but up to date there has been no news of that line hurtling hundredweights of haggis to the Highlands for Hogmanay or journeying with gigantic jugs of jujubes to Jericho so perhaps the air correspondents of dailies have not yet recovered from the festivities which so tear the heart of The Aeroplane's ill-used Editor and make him so unhappy.

A much-needed official order has been made forbidding smoking (by passengers and crew) on any British aircraft anywhere or on any foreign aircraft flying over British territory. This has long been an unwritten law written only in the cabins of commercial aircraft.

One understands that the Imperial Air Transport Company will preserve the colours of the present Air Lines for the various distinctive routes. Thus the present Paris route and its extensions will have Handley Page white machines. The Brussels, Cologne and Central Europe route machines will be Instone blue and the Rotterdam, Berlin and Northern Europe Line machines will be Daimler red.

Of new machines in the design or construction stage which will be at the disposal of the new firm will be the D.H.34 with new wings giving a slower landing speed and the D.H.54 with a Rolls-Royce Condor engine which will carry 14 passengers. It will have a span bigger by about 20 feet than the 34.

There is also the new Handley Page with two Siddeley Pumas and a central Napier Lion which is being completed at Cricklewood. The machine at present being built is for the Belgians but similar machines can be turned out quickly.

The New Year starts with great promises and many successes may be obtained if the problem of air transport is tackled in the right way and in a big way. To Civil Aviation in its new clothes, to all who have helped Civil Aviation in the past and to those to whom the future of Civil Aviation is to be entrusted and to those who have read these notes in the past and borne with one for these notes one wishes a very happy and prosperous New Year.

The Four Hundred and Fifty Horse Men.

On Monday Dec. 31 at a private studio of the Gaumont Company an excellent film was shown which depicted the 450 h.p. Napier Lion engine in all its stages of construction test and flight. The film opens with a view of the Napier works at Acton. The gates open and hundreds of the men who make the engines pour into the works. All the numerous and various parts of the Lion in process of manufacture and assembly are then shown in detail and there is also a short and quick "close-up" of the Napier Cub.

Various D.H.34s are shown at Croydon loading up with freight and passengers and the same machines are shown in the air. Memories of the past are conjured up with pictures of the Napier-driven Bamel and Gloster winning their Derbies and the Supermarine Sea Lion is shown preparatory to winning the Schneider Cup at Naples. The same machine is shown this year at Cowes with the U.S. ship *Pittsburg* (famous for having a town of the same name whose broadcast has been heard all over England and South Africa and intervening wastes) in the background.

Close-ups are then shown of Messrs. James, Carter, F. L. Barnard and Cobham, the latter unexpectedly promoted to the rank of captain and Mr. Barnard giving a good facial imitation of Mr. Charles Chaplin.

The film which is packed full of instructive incident is to be shown at the forthcoming Wembley Exhibition and at exhibitions all over the world.

An Aero Club for Manchester.

A Club has been formed in the Manchester district under the title of "The Lancashire Aero Club." Already certain of the members have constructed one light aeroplane, and it is hoped to begin the building of another light aeroplane early in the year. The Club is in negotiation for a flying ground and expects to have a shed at the disposal of its members shortly. While the main purpose of the Club is the practical, construction, and working side of aviation it is hoped to expand and embrace all branches.

Among the members are several well-known flying men under whose supervision the Club's first machine has been produced. The Hon. Secretary, Mr. C. J. Wood, c/o A. V. Roe & Co., Limited, Newton Heath, Manchester, will be glad to get in touch with any reader interested.

A Little Knowledge.

The following has been received :—

To the Editor of The Aeroplane.

Sir,—One writes more in sorrow than in anger Somebody once said (and spread by means of that medium which you affect to despise namely wireless) that an Editor is not to be pitied but to be abused. After reading your article in The Aeroplane of Dec. 26 under the heading "On Christmas Depressions" it seems that as you have already been so much abused you as the exception are also to be pitied.

One is very sorry that you have such an incompetent set of friends that they are unable to tune in their wireless sets correctly which consequently makes them (the sets not the friends) emit sounds "with a voice like a scratchy gramophone." Were any of these friends competent to use their sets (they need not necessarily be what the Americans call "radiofans" to do this) they could make them emit sounds far better than the best gramophone yet made and without the gramophone scratch. Moreover if these friends knew how to tune in the numerous broadcasting stations they would have a call on a selection of music etc. in excess of the repertoire of any average gramophone owner.

Your ignorance of what is now broadcast is simply amazing when you say that "Nothing half so funny is ever broadcast as were the intimate Cross-Channel conversations by wireless." But perhaps it is not ignorance so much as a height of brow and dyspepsia combined.

Surely you put too much responsibility on your bright brained friends when you credit them with coining such phrases as "loopy." This was in general use at one's preparatory school at the very beginning of the present century.

Presumably in your present state of mind it is no use wishing you a happy New Year but one hopes that by next Christmas careful dieting and new friends may enable you to spend a merry Christmas and a happy New Year for 1925. At present you are indeed to be pitied.—

Yours faithfully, "Peter Pan."

PERSONAL NOTICES.

Marriages.

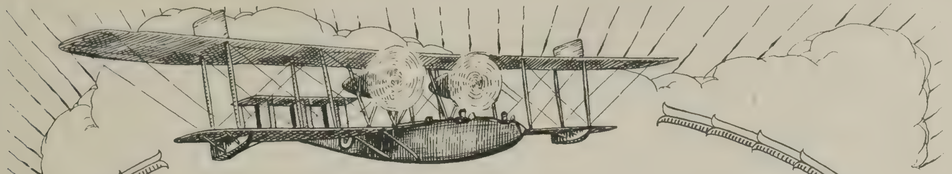
BERRINGTON—DOCKER.—On Dec. 22, at St. Marylebone Church, Bernard Eddowes Berrington, late R.A.F., youngest son of Mrs. Berrington, of Tunbridge Wells, to Olive Mimosa, younger daughter of the late Edwin Docker, M.A., and Mrs. Docker, of 22, Beaumont Street, W.

HERRING—HIND.—On Dec. 22, at Weston-super-Mare, Thrower Herring, R.A.F., son of Mr. and Mrs. Herring, late of "Petra," Weston-super-Mare, to Gladys Pretoria Hind, daughter of Mrs. Hind, of "Woodcliffe," Weston-super-Mare.

RAYNHAM—MACPHERSON.—On Dec. 24, at Woking, Frederick Phillips Raynham, only son of the late James Kistruck Raynham, of Hessett, Suffolk, and Mrs. Raynham, Elm Bank, Woking, to Marjory Purves Macpherson, daughter of the late John Ross Macpherson and Mrs. Keane, Oaklands, Woking.

Births.

MAYNARD.—On Dec. 16, at Gordon House, Sleaford, to Irene, wife of Sq. Ldr. F. H. M. Maynard, A.F.C., R.A.F.—a son.



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From the year 1912, S. E. Saunders Ltd., of East Cowes, have been constructors of Sea-going Aircraft. Both Boat and Float machines have emanated from their works, each class gaining the highest degrees of efficiency. Concurrently with these machines, high speed Motor Craft have been delivered to all parts of the world, many of which have since made history in Motor Boat Racing.

S. E. Saunders Ltd. are Designers and Constructors of all types of Marine Aircraft.

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STAG LANE AERODROME,
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Telephone : Kingsbury 160-164.

IN RETROSPECT.

One year is after all generally very like any other. Each has its outstanding peculiarities—but very few of them on reflection are found to have left behind any very marked impression that they have been years of an exceptional nature.

1923 from the aeronautical point of view has been a very normal year. There have been a number of notable events, there has been some progress to record, and there remains at the end of it the promise of still further progress in the future. It has in brief been like most of its recent predecessors a disappointing year but not altogether a black year.

There has been no great increase in the demand for or the use of aircraft for either military, commercial, or private purposes. There has been evidence of a wider general public appreciation of the importance of aircraft both as a weapon of defence and as a useful vehicle. There has been a steady though by no means a revolutionary improvement in the design of aeroplanes, and a number of extremely fine individual performances on new aircraft have marked the past year.

An Old Story.

From the purely British point of view the most unpleasing feature of 1923 is the fact that despite the very large amount of money which has been spent by the Air Ministry on the construction of new experimental aircraft, and despite the existence of quite a strong public support for the policy of maintaining an enlarged and efficient Air Force, the bulk of the R.A.F. is still mounted on machines of war-time design, and that there is as yet no evidence of the long-hoped-for production orders for modern types of aircraft for the re-arming of that force.

An almost equally disquietening feature of 1923 has been the revelation of the fact that in the matter of certain types of aeroplane—particularly the high-speed fighter class—even our most modern experimental machines are far inferior in performance to types which it is within the power of certain other nations to put into production, or even to certain types which are already being built in appreciable numbers abroad.

It may be said at once that this fact is due to no inferiority on the part of British designers. It is due to no lack of research work in this country which has left the British Aircraft Industry without the technical knowledge wherewith to equal say their American rivals. It is on the contrary largely due to the fatal policy in regard to new types which appears to rule in the Department of Supply and Research at the Air Ministry.

Jam Yesterday and Jam To-morrow but——

It is in brief the effect of too strenuous an effort to produce not the best possible service aeroplane for to-day, but the perfect aeroplane for the day after to-morrow. As a result we have had the best aeroplanes in the World in the past, we are promised perfect aeroplanes in the future, but we never have really good aeroplanes in actual service—and are not likely to have for a long time unless the said Department is either destroyed or reformed.

The design of an aeroplane—like all engineering design—is a matter of intelligent compromise between a number of conflicting requirements. To produce an improved aeroplane it is always necessary to take risks over certain details of the design in order to secure the desired end. It is the business of the one man who is responsible for the whole design to decide which particular risks can most rationally be taken to secure the given end. And the designer who has to work under the segmental control of the varied technical sections of the Air Ministry—none of them directly interested in the design as a whole, and each of them naturally anxious that no detail within their control shall be the cause of trouble in the completed machine—finds his hands tied in the essential process of design by a blank refusal on the part of each sectional authority to permit any serious compromise within their particular sphere of control.

How British Designers have to Work.

It is a fact that our best aeroplane designers to-day are more often than not set the task of designing an aeroplane to an official specification so detailed that it practically defines the design. In many cases the designer would prefer not to undertake the job at all—knowing that the result is likely to be unsatisfactory. But he is told plainly that he can build to that specification or build nothing. It is natural under the circumstances that the aircraft produced should be of very little practical value and of extreme costliness—particularly as in the majority of cases the official specification not only defines the design but calls for an equipment as various and comprehensive—and for practical military purposes probably as useless—as that of Alice's White Knight.

It is by no means altogether a bad thing that the Air Ministry should possess a department capable of superintending the design of specific types of aeroplanes, in this way, and there are definite advantages in getting experimental machines to such designs built and tested.

But the exclusive control of design by a Government Department in this manner is a very evil thing. For every experimental machine built to such official ideas there should be at least two orders for experimental types of equal load capacity and power built to the unfettered ideas of an independent designer. Undoubtedly such machines might be found not to provide facilities for all the quaint items of equipment which are officially regarded as desirable—but a correct view of the duties of the branch responsible for equipment is surely that it should produce equipment suitable for good aeroplanes rather than to spoil good aeroplanes in order that a particular type of equipment may be hung on to them.

Equipment or Aeroplane?

The design of equipment of military aircraft in times of peace is necessarily a speculative business. It must be based on deductions from past war experience and assumptions as to the probable conditions which will occur in future wars. Such deductions and assumptions in matters of detail have an unpleasant habit of being falsified by the actual event. And if the fashion in equipment is allowed to dominate the design of aircraft there is a very great risk that the resulting aircraft will be found to be useless when their equipment proves ineffective.

If on the other hand the design of equipment is made subordinate to the production of good aircraft then the aircraft will probably be found to be serviceable when fitted with a modified equipment.

Of two evils a good flying machine which can with difficulty be equipped for war-like purposes is probably preferable to a wonderfully-equipped apparatus which cannot keep the air. It is towards this latter extreme that we seem to be approaching under the present *régime*, and it is quite time that the balance was redressed by a few experiments towards the other end of the scale.

The Value of Self-Help.

It is however not altogether fair to blame the Air Ministry alone for their policy of controlled design.

There is one perfectly authentic case on record of an aircraft-constructing firm which succeeded in forcing the Air Ministry's hand. The firm in question submitted a design for a military type of aircraft generally to an Air Ministry type specification but embodying a number of distinctly novel constructional features which were far from being in accord with Air Ministry conventions. The firm were informed that the Air Ministry could not entirely approve the design and were not prepared to order any such machines.

The firm thereupon notified the Air Ministry that they nevertheless had actually started to build machines to that design in order to demonstrate their superiority over the conventional type which met with official favour.

And the Air Ministry thereupon revised its attitude and ordered a small number of these machines—which have in fact since shown themselves to possess certain distinctly good features.

And it may be suggested that a similar display of initiative on the part of the Aircraft Industry as a whole might produce a very marked effect on the present state of affairs. After all no really great Industry in this country has yet attained prosperity as a result of unadulterated spoon-feeding by the State. And the Aircraft Industry must look to itself—and not only to the Air Ministry—if it desires to attain a healthy condition.

Civilian Aviation.

Civilian aviation during 1923 has made steady progress in certain important directions. So far as the British Air lines are concerned, there has been a maintenance of a very high standard of safety and reliability in working, a standard not approached on the civilian services of any other country. Credit on this account is due very largely to the technical and operative personnel of the British Air lines, but also in no small measure to the Department of Civil Aviation of the Air Ministry—and to their executive staff at the various State Aerodromes. No one has a more violent objection to unnecessary interference with enterprise on the part of the State than has the present writer—but it is recognised that the State has certain responsibilities in the matter of public services and that it is entitled to exercise such a degree of control over such services as may be necessary in the interests of public safety and the like. In so far as the operation of existing services is concerned, the Department of Civil Aviation appears to have conducted itself with a very wise discretion and to have secured its legitimate ends with the least possible hindrance to the conduct of the air lines.

Unfortunately the air lines still suffer from a lack of business, and there is every reason to suppose that they will continue in this condition until they are able to give regular and frequent services over long routes entirely independently of such weather conditions as may temporarily prevail.

The difficulties of flying at night, in fog, or similar adverse conditions are practical difficulties, and the solution of

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these difficulties—as has recently been pointed out by Mr. Courtney—is to be sought rather in the training of the operating personnel to cope with these difficulties with the aid of existing appliances than in the invention of new appliances and apparatus.

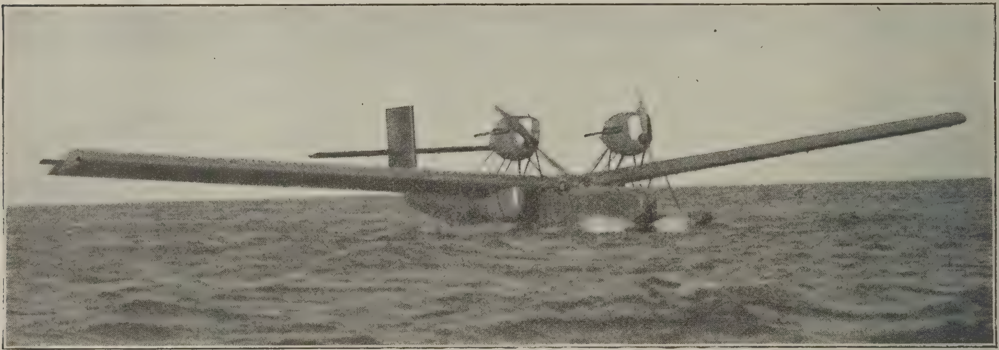
Practical experiments in the operation of aircraft under adverse conditions is an expensive business and the existing small air line firms had not the resources to undertake such work. The new Imperial Air Transport Company should be in a position to attack this particular problem, and if it fails to do so it will fail to justify its formation.

The brightest feature of 1923—so far as this country is concerned—was the success of the Lympne Light Aeroplane Competition.

The results attained show that the British Aircraft designers are still capable of taking an intense interest in their business, and can still produce first-class aircraft if their interest is aroused and their initiative is unhampered. It also shows that there is a very considerable section of the British public which takes a keen interest in a really sporting aviation meeting although perhaps relatively few people are willing to spend an afternoon in watching half-a-dozen assorted machines depart from an aerodrome shortly after lunch and return thereto in the middle of what should be teatime.

Altogether then it is still permissible to hope that by this time next year it may be possible to record definite signs that aviation in this country is beginning to stand on its own feet.

A ROHRBACH FLYING-BOAT.

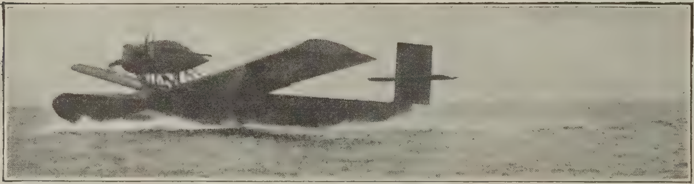


The Rohrbach Flying Boat (2 Rolls-Royce Eagle IX Engines).

The Rohrbach Metal-Aeroplan A.S. of Copenhagen have produced to the designs of Dr. Ing. A. Rohrbach a large twin-engine flying-boat which underwent its first tests early in November at Amager near Copenhagen. Dr. Rohrbach it will be remembered was responsible for the design of the Staaken four-engined monoplane which afforded the Commission Aéronautique Interalliée so splendid an opportunity of displaying their ability.

The present machine which is shown in the air in a photograph is an all-duralumin monoplane of very similar construction to the Staaken monoplanes.

The two engines in this case are carried well above the wing which is apparently built on to the top of the hull. There is a normal central hull, and a pair of very large side floats are carried from the wing below the engine mounting.



The Rohrbach metal flying-boat taking off. The float system appears to produce quite a lot of spray, but relatively little serious disturbance, and the airscrews seem to be well clear of any solid water.

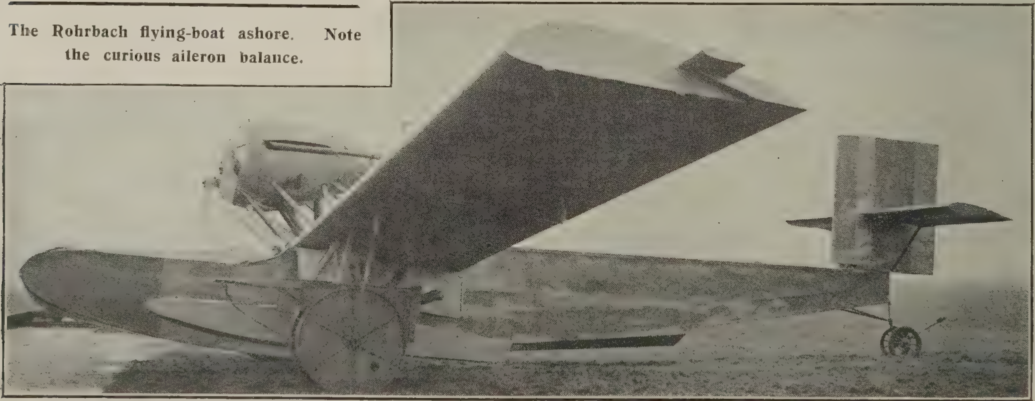
The machine is equipped with two Rolls-Royce Eagle IX type engines and is designed to carry 12 persons.

A noticeable feature of this machine is the extremely pronounced dihedral of the wings. Another curious feature is the pair of enormous petrol tanks suspended below the wings under each engine and over the side floats.

The main dimensions are given in the specification below.

SPECIFICATION.

Span ...... 29 m. (95 ft. 3 in.)
Length...16.5 m. (54 ft. 2 in.)
Weight, empty 3,700 kg. (8,140 lbs.)
Weight, loaded 5,700 kg. (11,440 lbs.)
Max. speed 220 km.h. (136 m.p.h.)
Landing speed 110 km.h. (68 m.p.h.)
Climb to 3,000 m. (9,840 ft.) 20 mins.
Ceiling... 4,500 m. (14,750 ft.)
Fuel capacity ... . 8 hours.



The Rohrbach flying-boat ashore. Note the curious aileron balance.

The Rohrbach flying-boat in the air.

New Aircraft for Canada.

One who is closely in touch with Canadian Civil Aviation writes :—

Commercial companies in this country are faced with the problem of replacing their flying equipment by new machines and ought to look over the situation in England with a view to obtaining some new machines which can be obtained at a lower capital cost than the present types, and which will be cheaper to run. The future of forest patrol depends on this.

If the Aircraft Industry can produce a two-seater, either a boat or float type, at a relatively low first cost which will be less expensive to operate than the present types, there is undoubtedly a big market in this country and they can sell machines by the score as the Air Board's work and that of the commercial firms have proved conclusively to the Lumber and Pulp Industry that the solution of their fire protection problem lies in the greater use of aircraft.

It is only a question of cost, both capital and operating, that is preventing the use of aircraft all over the Laurentian forest area and also in British Columbia.

New Technical Literature.

Aeronautical Research Committee. R. & M. No. 830.—Experiments with a Family of Airscrews including effects of Tractor and Pusher Bodies. Part II, Experiments on Airscrews with Tractor and Pusher Bodies. By A. Fage, C. N. H. Lock, H. Bateman and D. H. Williams. Price 1s 9d.

R. & M. No. 840.—The Constitution and Age-Hardening of the Ternary Alloys of Aluminium with Magnesium and Copper. By Marie L. V. Gayler. Price 1s.

R. & M. No. 841.—The Heat Treatment and Mechanical Properties of Alloys of Aluminium with Small Percentages of Copper. By D. Hanson and Marie L. V. Gayler. Price 6d.

R. & M. No. 852.—Fire Experiments with Various Types of Fire-Proof Bulkheads. By the Staff of the R.A.E. Price 1d.

R. & M. No. 875.—The Northerly Turning Error of Compasses in Aircraft. By A. P. Rowe. Price 1s.

R. & M. No. 877.—Tests of the R.A.E. Gear Wheel Type Petrol Pump. By the Staff of the R.A.E. Price 6d

R. & M. No. 878.—Phase Setting of Engine Indicators. By H. Moss and W. J. Stern.

United States National Advisory Committee for Aeronautics. Report No. 173.—Reliable Formulæ for Estimating Airplane Performance and the Effects of Changes in Weight, Wing Area or Power. By W. S. Diehl.

Technical Note No. 163.—Graphical Method for Calculating the Speed and Climbing Abilities of Airplanes. By Adolph Rohrbach and Edwin Lupberger. (From Technische Berichte.)

Technical Note No. 164.—General Theory of Windmills. By Max M. Munk.

Technical Note No. 165.—Tests on Rivetted Joints in Sheet Duralumin. By H. F. Retten and G. Thumin.

Technical Note No. 166.—Determination of Climbing Ability. By H Blasius. (From Technische Berichte.)

Technical Note No. 167.—Wind Tunnel Tests of Five Strut Sections in Yaw. By E. P. Warner.

Aeronautical Research Committee's publications are published by H.M. Stationery Office, London, and can be had from book-sellers.

Enquiries as to the supply of copies of Technical Notes and Reports of the U.S. National Advisory Committee should be addressed to the N.A.C.A. Technical Assistant in Europe, 5, Rue de Chaillot, Paris.

The Institution of Aeronautical Engineers.

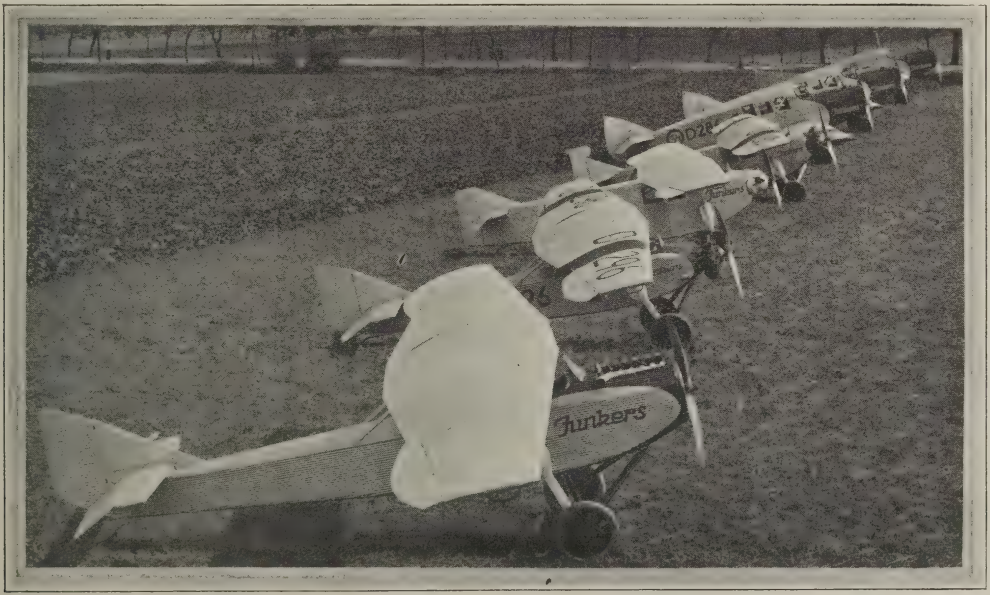
Mr. Rowledge's paper on Water-cooled Aero-Engines which is to be read before a joint meeting of the Institution of Automobile Engineers and the Institution of Aeronautical Engineers, is to take place on the evening of Wednesday, Jan. 9. This paper will be of the greatest interest. Tickets may be had from the I.Ae.E., 60, Chancery Lane, W.C.2.

Smith's Christmas Party.

As in past years S. Smith and Sons (M.A.) Ltd., the well-known manufacturers of aircraft and motor accessories, gave a party this Christmas to the children of the workers in their factory at Cricklewood. Over 700 children attended the party.

After tea and games they were entertained with music dancing and conjuring after which each child was presented with toys, balloons and sweets by Father Christmas, impersonated by Mr. B. Haviland, Works Manager.

After the children had left, the evening was given over to the elder members for dancing and a sing-song.



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THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

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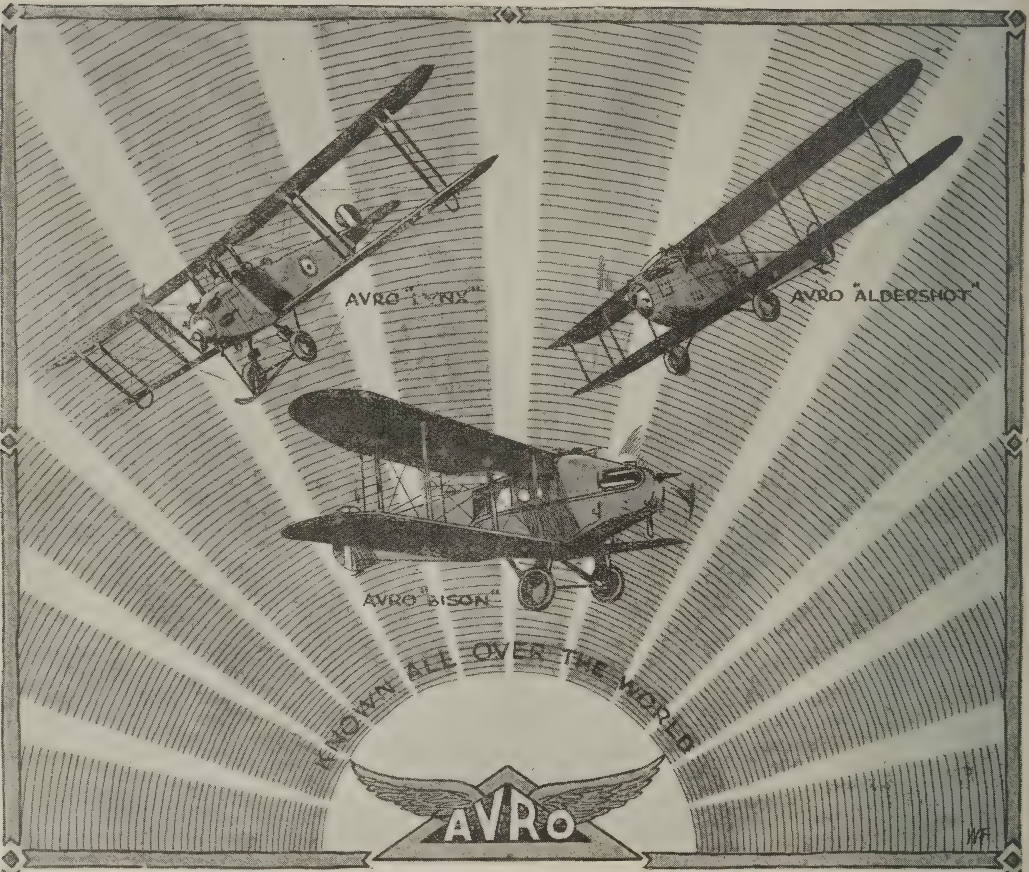

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ON EXPANDING THE AIR FORCE.

It appears that the Air Ministry is determined, whatever may be the fate of the present Government, to accomplish that expansion of the Air Force which has been so much discussed during the past year. The following document in evidence of that determination was issued on Jan. 3 :—

The Air Ministry announces :—

The Royal Air Force is prepared to engage during the current year approximately 400 officers for flying duties under the Short-service commission scheme and applications are accordingly invited immediately from suitable candidates Nearly 350 of these are required as a result of the authorised expansion of the Air Force for home defence, the remainder being needed to replace officers who automatically pass to the Reserve of Air Force Officers on termination of their period of engagement With this addition, the total number of short-service officers engaged on flying duties will be about 1,400.

Candidates, who should be of good education but who need not have had any previous flying experience, must not be less than 18 and not more than 29 years of age at the time of entry. They will be interviewed by a Selection Committee, and those selected, after passing the standard R.A.F. Medical examination, will be gazetted as pilot officers on probation. The probationary period is six months, after which, subject to satisfactory progress, officers are confirmed in rank.

Short-service commissions are granted for five years' service on the active list, followed by a period of four years' service on the Reserve.

For all purposes of pay, allowances, and promotion short-service officers receive equal treatment with officers holding permanent commissions. The present rates of pay and allowances for unmarried pilot officers amount to £1 5s 10d. per day or about £471 per annum. In addition, short-service officers receive on transfer to the Reserve on the termination of their period of regular service, a gratuity of £75 per annum or a sum of £375 for the whole period of service on the active list. When they are transferred to the Reserve they receive retaining fees and are required to undergo short periods of flying training each year on up-to-date war-type aircraft.

Pilot officers will be posted to one of the Royal Air Force flying training schools where they will undergo a course of training in aviation and in aeronautical, military and technical subjects for a period of about a year. At the end of this period they will be posted to an Air Force Squadron for duty. Pilot officers, subject to satisfactory progress having been made, will be promoted to Flying Officers, with increased rates of pay, after completing 18 to 21 months' service from the date of being gazetted as pilot officers.

A limited number of officers serving on short service commissions may be selected for transfer to the permanent list, and officers so selected will be allowed to count their actual service on their short service commissions towards retired pay or gratuity under the permanent officers scales, but will not be eligible for the gratuity of £75 a year mentioned above

All officers entered under this scheme are taught to fly, and special facilities are afforded to study certain other subjects, and especially to enable them to qualify for the A.M.I.M.E. Arrangements have also been made for all officers who desire it to receive special tuition from the R.A.F. educational officers, who have been recently appointed, to equip themselves for civil life against the time when their period of service terminates. It is hoped during the next few years greatly to extend these educational facilities.

Application forms and copies of the detailed regulations can be obtained by applying in writing to the Secretary, Air Ministry, Adastral House, Kingsway, London, W C.2.

It is earnestly to be hoped that the required number of applicants for short service commissions will be found. The uncertainty of the political situation may deter a good many for the next few months for many men of precisely the most desirable class will doubtless argue that it is useless to join the R.A.F. on a short service commission if there is the chance of a Labour Government coming into power and decreasing the Air Force instead of expanding it. One believes that there is a section of the Labour Party which has expressed its intention of wrecking all the King's Fighting Services, especially the Air Force. But one also believes that the more serious men at the head of the Labour Party have just as keen an appreciation of the value of and need for air defence as have the Conservative or Liberal leaders—in fact very probably their understanding of air affairs is greater than that of the Liberals, with the exception of Mr. Churchill and Captain Guest.

Also, we are by nature a conservative people and it would need considerable courage on the part of a Labour Government to break right away from all precedents and reverse at once a defence policy laid down by its predecessor.

Consequently one does not think that any aspirant aviator need hesitate for political reasons about sending in his application. And in any case it is fairly certain that before he has been called before the Selection Board the political situation will have cleared and we shall know fairly where we are.

A more serious deterrent of applications from men of the right class is the whole system of Short Service Commissions. The youngster of eighteen or twenty years of age who is too old for Cranwell may get a permanent commission by way of a short service commission, much as a militia subaltern used to be able with luck to get a regular commission in the Army. But there is always the uninviting prospect of being thrown out of the Air Force at 23 or 25 years of age without a profession and without any provision for the future other than the £375 bonus.

Nearly every man who holds a short service commission hopes to have it made permanent, and there are in the Air Force to-day hundreds of S.S. officers (as they are commonly called) who are within a year or so of being time-expired, who have almost given up hope of a permanent commission, and who in consequence have lost all ambition and keenness and so have become a menace to the moral of the R.A.F. It would be better in fact if these particular officers were told definitely a year at least before their time is up that they will *not* be made permanent.

And one would suggest that a certain definite proportion of permanent commissions be allocated each year to each year's entry of S.S. officers. It is the "Yes and No" attitude of the higher authorities which is so irritating.

The new educational scheme to help S.S. officers "to equip themselves for civil life" is good, and a good many of the time-expired may go straight into professions or trades as the result. Also, five years hence Civil Aviation ought to be in something like working order and naturally the air lines will be manned throughout by time-expired officers and engineers. So actually the S.S. officer who leaves at the age of 25 to 28 is at least as well off as is the young engineer who is fired from his first job after serving his time in the shops. And few men who are really successful ever find their true walk in life till they are well over 30. It is only the man who is content to stick in a groove and wait for promotion or increased pay on mere seniority who settles into his life's job at an earlier age. Even in the Services the great commanders do not settle down to be regimental officers up to the age of 30.

On the whole therefore it seems that it is well worth the while of any energetic young man who believes in himself to apply for a short service commission. He will have in the R.A.F. at least as good an opportunity as he would have in commerce or in a profession. A great deal of nonsense is talked about favouritism in the Services. It is said that Lord Fisher wrote in the log-book at the Royal Naval College at Osborne;—"Favouritism is the essence of efficiency." That is true, for an efficient commanding officer only favours efficient subordinates, whereas an inefficient senior favours inefficient subordinates, and so breaks himself all the sooner.

But there is far more favouritism in trade. Many a fine firm has been ruined because inefficient sons and nephews of directors have been put into jobs which ought to have been filled by efficient ordinary employees. There were notable instances in the Trade during the War 1914-18.

In selecting the 400 needed officers it is to be hoped that the Selection Board and the Medical Board will display a little more common sense than they have done in the past. It is quite surprising how many queer people have managed to squeeze through the Selection Board considering how many quite reasonably decent men have been refused. And the Medical Board are far worse. The R.A.F. doctors seem to go entirely by physical tests and seem incapable of understanding that a one-eyed man with brains will probably make a far better pilot than will a brainless man with two perfect eyes, or that a man who has done a lot of flying without being airsick will go on flying happily in spite of their comic mechanical tests indicating that perhaps he may be sick some time or other. And they neglect the fact that very few of the best war-time pilots would pass any of their present-day tests. Both Boards have lost the R.A.F. a number of good officers simply through being too academically correct in their methods.—C. G. G.

1923.—(PART II.)

BY C. G. GREY.

CIVIL AVIATION.

In Civil Aviation as in Service Aviation 1923 has been a remarkable year. And as the R.A.F. has been happy in its chiefs so has Civil Aviation. Primarily much of the credit for the success has been due to Major-General Sir Sefton Brancker, Director of Civil Aviation, who at various times when crises have arisen in the running of the air lines has handled the difficulties with firmness and decision and has overcome them with promptitude and despatch.

Early in the year when the old subsidy scheme expired he worked a new scheme through the Air Ministry and the Treasury to keep the air lines going. In 1922 he had engineered the altered subsidy scheme by which Handley Page Transport Ltd. took over the London-Paris route and the Instone Air Line Ltd. took over the Cologne route and the Daimler Airway took over the Amsterdam route and extended it to Berlin, each guaranteeing a minimum mileage in the year for a fixed subsidy. Then when the lines ran out to their minimum mileage and had no further incentive to continue flying he secured an extension of the subsidy for further mileage at the same rate. Later again when the Hambling Committee recommended the formation of a National air transport company, which has become known familiarly as the Million Pound Monopoly Company, and the three existing lines plus the projected Supermarine flying-boat line fell out by the way, like Joseph's brethren in their co-operative descent on the flesh-pots of Egypt, Sir Sefton had much to do with persuading them into the reasonable frame of mind which ultimately produced a fusion of interests and the formation of the Imperial Air Transport Company which was announced officially on Dec. 28.

Apart from this diplomatic work, Sir Sefton with his enthusiastic assistants General Festing, Colonel Edwards and Colonel Shelmerdine have run all the business end of Civil Aviation, such as the control and issue of licenses to civil aviators and aeroplanes and aerodromes with marked success. Commercially-minded people and irresponsible sportsmen may argue that our strict regulations governing the physical and mechanical qualities of men and machines are irksome and cramp their style, but it is indisputably a fact that as the result of those regulations British pilots and British aircraft hold a reputation all over the World which is unequalled by those of any other country.

Also General Brancker has somehow found time to deliver numerous speeches to important institutions, all over the country and at conferences and dinners and other places where people of note do congregate. And as a propagandist speaker of the most convincing and entertaining kind Sir Sefton is unbeatable. He not only persuades his audience to believe what he is saying but persuades them that he believes it himself. His gift of phrase and sense of humour make an entertainment out of what from another would be merely a dull sermon on a dull subject, for few subjects are essentially more dull than is commercial aviation. For this reason if he had no other qualities he would be one of the greatest assets of Civil Aviation in this or any other country.

Like the Chief of the Air Staff the Director of Civil Aviation has had most loyal support from the Secretary of State for Air and from the Under-Secretary. Sir Samuel Hoare was primarily responsible for the appointment of the Hambling Committee and has backed the subsidy scheme with all the weight of his experience and influence. The Duke of Sutherland who is more intimately concerned with the detail work of Civil Aviation has worked hard to educate himself to a knowledge of aircraft and has shown his personal interest by presenting the very handsome Sutherland Prizes for light aeroplanes in 1923 and 1924.

Both Sir Samuel Hoare and the Duke of Sutherland have won the confidence and personal esteem of everybody in Civil Aviation by the friendliness with which they have met every proposal which has been put up to them and by their evident desire to do their utmost to assist progress. Following as they did two such capable Ministers as Captain Frederick Guest and Lord Gorell they had a difficult task in convincing the aeronautical community that they could do as well as their predecessors, and they have succeeded admirably. One would not presume to make comparisons between the Liberal and the Conservative Ministers, for each has excelled in certain qualities, so one can only say that we are equally grateful to each of them for his services to Aviation.

THE CONFERENCES AND THE SPREAD OF INTELLIGENCE.

The first notable event of 1923 was the British Air Conference in February. This cost a good deal of time and money but it served some useful purpose in procuring a good deal of publicity for aviation at a slack time of the year when newspapers had room to record words rather than deeds.

Much more important was the International Air Congress in June which was opened by the Prince of Wales and included receptions by the Duke and Duchess of York, Sir Samuel and Lady Maud Hoare, by the Duke and Duchess of Sutherland, and by the Lord Mayor of London. Practically all the chiefs of Aviation of all foreign nations were present and much good has resulted from the meeting on friendly terms of so many of those who are making history.

One of the best pieces of work by the Department of Civil Aviation backed by the Air Ministers was the securing of a subsidy for the Society of British Aircraft Constructors to help a co-operative exhibit of British aircraft at the Gothenburg Exhibition in July. This was a notable function because for the first time in history British aircraft firms really co-operated instead of trying to cut one anothers' throats. Also the Trade co-operated handsomely with THE AEROPLANE newspaper in producing a tri-lingual review (in Swedish, German and English) which, one gathers, helped materially to spread intelligent knowledge of British aircraft in Northern Europe and the Baltic States. The Gothenburg affair was a pronounced social success, albeit the hardy Norsemen's ideas of hospitality approached what to the softer Englishmen appeared to be an alcoholic orgy.

The S.B.A.C. has done much good in 1923, under the chairmanship of Mr. C. R. Fairey, who succeeded Sir Henry White Smith, the chairman of the Society from its foundation. Mr. Fairey's strong personality and his wit and tact have enabled him to negotiate successfully alike with Air Ministry officials and with members of the Trade and with the Race Committee of the Royal Aero Club in matters where Trade and Sporting interests have come into conflict or where the success of a sporting event (as it usually does) have depended on Trade support. The Trade must feel grateful not only to the eminent Chairman of the S.B.A.C. but to the Secretary, Mr. C. V. Allen, whose unflagging energy and courtesy have done so much to make easy any dealings anybody has had with the S.B.A.C.

AIR LINE WORK.

In air line work much progress has been made in 1923. Up to the Autumn far more passengers and goods had been carried across the Channel than in the previous year and in proportion a smaller number of machines were used, thanks to the high degree of efficiency attained.

The system of intensive flying instituted on the Daimler Airway by Colonel Searle and Major Woods-Humphrey showed on the Amsterdam route, extended in May to Berlin, that pilots and machines and engines could do far more than had been expected of them. Pilots flew 1,000 miles a day instead of a week as heretofore. The De Havilland 34 biplanes did 300,000 miles without showing signs of needing overhaul. Engines were changed during the night so that machines were used day after day instead of standing idle while their engines were being overhauled. The result was immensely increased mileage without any increase in overhead standing costs. By this way paying commercial aviation will ultimately be attained.

Handley Page Transport under the management of Mr. Savage demonstrated the extreme reliability of the twin-engined Handley Page W8bs. So far as one can recall they had only one "write-off" in the year and that was an absolutely unpreventible accident in which nobody was hurt.

The Instone Air Line, managed by Major Sam Greer with the assistant omniscience of Ogilvie & Partners Ltd., personified in Colonel Bristow, attained on the Cologne line as high a degree of efficiency as could be wished. This line served a particularly good purpose in affording direct communication between London and Cologne, so avoiding the vexatious interference opposed by the French and Belgians to all who try to reach that city by terrestrial methods

Late in the year the Supermarine Company of Southampton under the title of the British Marine Air Navigation Co. Ltd., and energised by Mr. Hubert Scott-Paine began a series of trips with Supermarine flying-boats to the Channel Islands by way of preliminary canters for a regular service to the Islands and Cherbourg in 1924. These trials were very satisfactory and demonstrated fully the immense superiority of air transport over old-fashioned steamships.

In contrast and in competition with the subsidised air lines the De Havilland Hire Service proved what could be done by pure commercial organisation and economy. Their fleet of air taxis, consisting of war-time D.H.9s, covered immense distances, and their increased popularity may be gauged by their doing 216 hours flying in May 1923 as against 130 hours in May 1922. Numerous long-distance journeys were made all over Europe, one covering some 5,000 miles and visiting every civilised European capital. On Derby Day kinematograph films taken at Epsom at 15.00 hrs. were distributed all over Great Britain the limit being reached by one which was shown on the screen at Aberdeen at 22.00 hrs. the same day.

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Siège Social—Oficina Principal.

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Contractors for the laying out and complete equipment of Passenger, Mail and Express Goods Services by Aircraft.

Designers and Manufacturers of the Fairey Type III. Series of Machines as supplied in quantity to the British Government during the War and since its termination. In this series of Machines the Fuselage, Centre Plane, Tail Unit, etc., are standard and are adapted to take different types of wings, chassis and engines of other Machines of the series to suit the particular purpose for which the machine is required. All machines of this type have folding wings and are fitted with our patent Variable Camber Gear giving high performance and lifting power combined with low landing speed.

Fournisseurs des Ministères de la Guerre, de la Marina et de l'Air.

Seuls détenteurs du brevet Fairey pour dispositif de cambrure variable pour aéroplanes, hydravions et bateaux volants.

Constructeurs de toutes espèces d'hydravions, bateaux volants, aéroplanes, appareils amphibies avions spécialement aménagés pour levèes topographiques et photographiques, hangars flottants et équipement complet pour ces derniers.

Constructeurs, sur commande spéciale du Gouvernement Britannique du plus grand bateau volant construit jusqu'à ce jour.

Etude et entreprise de la fourniture du matériel complet pour services de transport aérien rapide de passagers, postes et marchandises. Constructeurs des Fairey Type III. Série de machines journies en grandes quantités au Gouvernement Britannique pendant la guerre et depuis la cessation des hostilitiés. Dans cette série de machines, le fuselage, le plan central et la queue, etc., sont de type normal, et sont construits de manière à pouvoir recevoir des ailes de types differents, ainsi que des châssis et moteurs d'autres machines de la série, de manière à être appropriés à l'usage auquel la machine est destinée dans chaque cas particuleur. Toutes les machines de cette série ont des ailes démontables et repliables et sont munies de notre dispositif breveté de cambrure variable, qui permet les plus grandes performances et qui combine une grande puissance de soulèvement avec une faible vitesse d'atterrissage.

Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Británicos.

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéreos.

Diseñadores y constructores de hidroaviones, barcos, aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de aparatos especialmente adecuados para el levantamiento de cartas topográficas y fotográfias, hangares flotantes y completo equipo para estos mismos.

Diseñadores, por orden especial del Gobierno Británico del barco aéreo más grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suministrados en grandes cantidades al Gobierno Británico, durante la guerra y *después de su terminación.* En esta serie de paratos, el fuselage, el plano central y la unidad de la cola, son de tipo normal y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para los fines particulares a que se destina el aparato en cada caso. Todas les máquinas de este tipo, tienen alas plegadizas y están provistas del dispositivo patentado de combeo variable Fairey que da una alta capacidad y potencia de ascensión combinada con una velocidad baja de aterrizaje.

The firm ran these taxis at two shillings and sixpence per mile and made a profit. In fact so much so that the De Havilland manufacturing branch and the Hire Service between them have actually paid a dividend in each of the two years of their existence, celebrating the event by a dinner given as one director remarked "to spend the dividend."

The number of "joy-ride" firms now promenading the country has decreased during 1923, but Mr. Fred Holmes of the Berkshire Aviation Tours and Mr. Muir of the Surrey Flying Services still seem to be doing well and one or two minor concerns exist.

The appallingly bad weather of October November and December almost stopped regular flying and the air line returns for mileage and passengers carried in those months are far below the figures for 1922 and frequently below 1920. This bad result has been aggravated by the fact that owing to the delay in forming the Imperial Air Transport Company neither pilots, managers, mechanics nor directors knew where they were and having no certainty of employment in the coming year they lacked the enthusiasm which is necessary to run an air line in bad weather. It is to be hoped that with improved ground communications and machines and engines we shall ere long see a revival of civil flying.

The Imperial Air Transport Company is guaranteed ten years of existence at least and if it spends its money wisely it should bring into being several types of aeroplanes within the next two or three years which will be capable of earning their own keep. And then the success of Civil Aviation will be assured.

SPORTING FLYING.

On the sporting side 1923 has been a very good year. The first race was flown on June 23 from Lympne to Croydon, thence Birmingham and Bristol and Croydon and back to Lympne. The prize was a cup presented by the Lord Edward Grosvenor and it was won by Flt. Lt. Longton on a Sopwith Gnu of 1919 make with a Le Rhône engine. The owner was Lt.-Col. Frank McClean.

The second big event was the King's Cup Race on July 13 and 14 (Hendon, Birmingham, Newcastle, Glasgow, Manchester, Bristol and Hendon). It was won by Mr. Frank Courtney on an Armstrong-Whitworth Siskin with an Armstrong-Siddeley Jaguar engine.

The third big race was the Aerial Derby round London from Croydon on August 6. The winner was Mr. Lawrence Carter on the Gloucestershire Aviation Company's Gloster (a revised version of the Mars I, commonly called the Bamel) with a Napier Lion engine.

The fourth big race was that for the Schneider International Seaplane Trophy held at Cowes on Sep. 28. It was won by Lieut. D. Rittenhouse of the United States Navy on a Curtiss float seaplane with a Curtiss D.12. engine. Another similar machine was second. And the only other competitor to complete the course was the Supermarine Sea Lion (Napier Lion engine) which won the trophy at Naples in 1922.

All these races were very well organised and run by the race Committee of the Royal Aero Club, and although at times it has been necessary to criticise the decisions or lack of decision of the Committee it is at least certain that no governing body of the Sport of Flying in any other country has done any better than has the Royal Aero Club. The Secretary, Mr. Harold Perrin and the Assistant Secretary Mr. Stevenson have worked unceasingly for the good of the Club and of the Sport, they have taken criticism and chaff alike in a proper and sporting spirit, and their detail staff work at all the meetings has been excellent.

The last work of the Club in 1923 was the organisation of the Light Aeroplane Competitions at Lympne beginning on Oct. 8 for the Sutherland Prize and the *Daily Mail* prize, and an exhibition meeting for the same machines at Hendon on Oct. 27. Both these meetings were notable successes and demonstrated conclusively that man can fly with approximately one-tenth of the horse-power hitherto considered necessary.

THE TECHNICAL SIDE.

Last week Captain Sayers dealt with the lessons of 1923 from the strictly technical point of view but it seems well to add a little information of merely practical interest.

The Aircraft Trade has been particularly active during the year in producing new types of aeroplanes and in perfecting types designed in 1922. Taking the firms alphabetically :—

Armstrong-Whitworth Aircraft Limited have built an all-metal version of the Siskin (Jaguar 320 h.p.) which is a high-speed single-seat fighter.

The Avro firm has had marked success with the Aldershot long-range bomber (Rolls-Royce Condor 700 h.p.), with its bigger development the Avro-Napier (Cub 1,000 h.p.) and with the Bison fleet-spotter (Napier Lion 450 h.p.)

The Blackburn firm has had large orders for the Dart (Napier Lion 450 h.p.) a torpedo-dropping deck-flier with a good performance : also the Blackburn (Napier Lion 450 h.p.), a fleet-spotter.

The Bristol Co. has produced the Bullfinch, a single-seater monoplane, and a new version of the old familiar Fighter, both with Jupiter engines of 400 h.p.

Boulton and Paul's of Norwich have developed the all-steel Bolton (two Napier Lions, 450 h.p. each) and the Bodmin an all-steel biplane with an engine room in the fuselage (two Napier Lions 450 h.p. each) and gear-driven airscrews on the wings.

The De Havilland firm have produced the D.H.50 (Siddeley Puma 240 h.p.) which with four passengers and a pilot has a higher performance and a longer range than had the famous D.H. 9 with the same engine. Also two-seater fighters, one with a Napier Lion and one with an Armstrong-Siddeley Jaguar.

The English Electric Co. has built an interesting new type of flying boat known as the Ayr (Napier Lion 450 h.p.) in which the lower wings serve as their own floats.

The Fairey Company has produced the Flycatcher, a deck-flying single-seat fighter (Armstrong Jaguar 400 h.p. or Bristol Jupiter 400 h.p.) with a remarkable range of speed—40 to 150 m.p.h.—and amazing controlability; also the Fawn a two-seater fighter (Napier Lion 450 h.p.) : also an amphibian Flycatcher with wheels fixed in sprung floats : also a huge float seaplane (Rolls-Royce Condor 700 h.p.) for long-range sea work.

The Gloucestershire Company have produced the Grebe (Armstrong Jaguar 320 h.p.) and the Grouse (Bentley Rotary 230 h.p.), both high-speed fighters, as well as the Gloster (Napier Lion 450 h.p.) a pure racing machine.

The Hawker Engineering Co., descended from the famous Sopwith Co., has built the Duiker (Bristol Jupiter 400 h.p.) a two-seater monoplane fighter and the Woodcock (320 h.p Siddeley Jaguar) a single-seater fighter.

The Parnall firm of Bristol has produced the Plover (Bristol Jupiter 400 h.p.) a useful single-seat deck-flying fighter : also the Possum (Napier Lion engine 450 h.p.) a "postal" triplane with an engine in the fuselage driving a geared airscrew on each wing.

Short Bros. of Rochester produced the Springbok, an all-metal two-seater fighter (Bristol Jupiter 400 h.p.).

The Supermarine Co. of Southampton has produced the Sea Eagle flying boat (Rolls-Royce Eagle 360 h.p.) a sea-going boat for four passengers and pilot : also the Sea Lion (Napier Lion 450 h.p.) a deck-flying amphibian fleet-spotter.

Vickers Ltd. have produced the Victoria 25-seater troop-carrier (two Napier Lions 450 h.p. each) : also the Vanguard 25-seater commercial machine (two Napier Lions 450 h.p. each) : also the Virginia long-range bomber (two Napier Lions 450 h.p. each) : also the Vixen two-seater fighter (Napier Lion 450 h.p.).

The light aeroplanes which were built for the Lympne Competitions and flew successfully were the Air Navigation and Engineering Co.'s monoplanes; the English Electric Co.'s Wrens; the Avro monoplane and two biplanes; the Gnosspelius Gull, commonly called the Gnosspelicopter; the De Havilland 53s, Sylvia II and Humming Bird; the Parnall Pixie; and the Vickers Viget.

Among aero-engines the Napier Cub, 1,000 h.p.; the Napier Lion, 450 h.p.; the Rolls-Royce Condor, 700 h.p.; the Rolls-Royce Eagle VIII and IX, 360-400 h.p.; the Bristol Jupiter, 400 h.p.; and the Armstrong Siddeley Jaguar 400 h.p. represent about the World's best in engines for aircraft.

Thus it may be seen that the Trade has been fairly active mentally if not financially during 1923.

Among technical institutions the Royal Aeronautical Society, the oldest air association in the World, seems to be showing signs of senile decay. Its lectures though interesting draw very small audiences and poor discussions and the Society has displayed little or no other activity. That this is not the fault of Col. Lockwood Marsh, the Secretary, is proved by the great success of the International Conference for which he did all the organising. One imagines that the Committee or Council of the Society are too scientific and not sufficiently mundane to trouble about making their meetings attractive.

On the other hand the young Institution of Aeronautical Engineers, an association of eminently practical men, has shown remarkable activity and has produced lively meetings and debates. The Secretary, Mr. Howard Flanders, one of the pioneers of British Aviation, is to be congratulated on the results of his work.

Of the work of the purely technical people such as the R.A.E., the N.P.L., the University Professors and the Air Ministry scientists, one will not venture to write. They cost a lot of money though their results do not appear in the air—or perhaps disappear in the air—and presumably somebody somewhere somehow sees that they give value for money received. Perhaps Captain Sayers will deal with them.

At any rate it seems that though there has been no boom in Aviation in 1923 it has been a year productive of much useful progress, and that the foundations have been laid on which a solid edifice of air power and air industry may be built. For that much we can be thankful to our Air Ministry which on the whole has done its job well.

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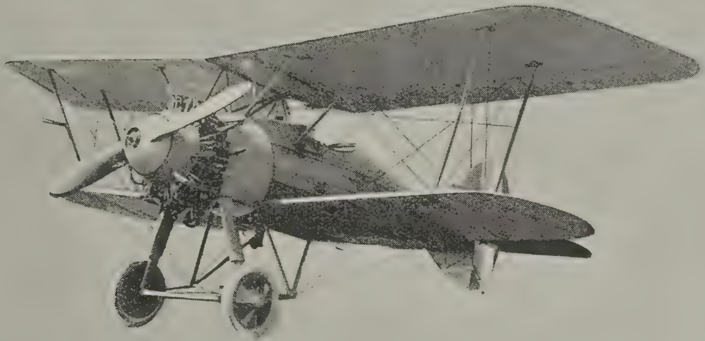

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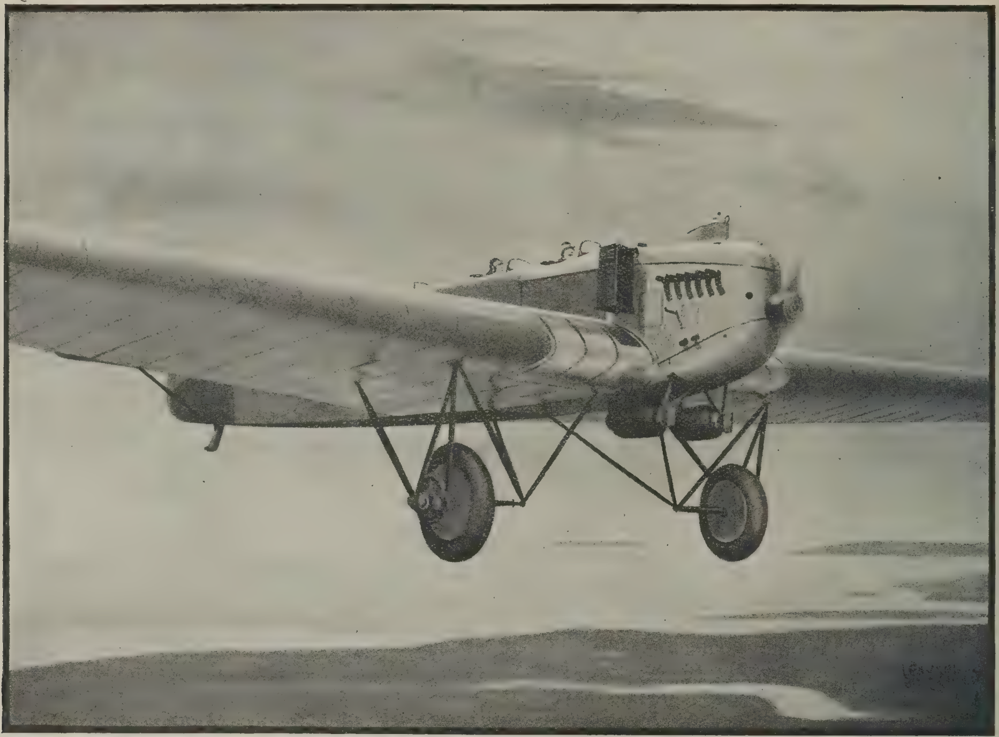

A WORLD CRUISER?—A wash drawing by Mr. Leonard Bridgman of the Fokker T.W.3 (360 h.p. Rolls-Royce), five of which have been ordered by the Portuguese Government for the forthcoming Round-the-World flight by Captain Sacadura Cabral and Rear-Admiral Gago Coutinho, of the Portuguese Navy. The machines have interchangeable float gear and land undercarriages and are fitted with Lamblin as well as the Fokker retractable side radiators.

Fairey Seaplanes in Australia.

According to *The Sydney Herald* of Nov. 16 the following report was issued by the Defence Department concerning the first official seaplane flight from Melbourne to Sydney.

> The Fairey 3.D. seaplane completed a most successful flight to Sydney yesterday
>
> Leaving Point Cook at 5 a.m. and proceeding along the coast, via Port Albert, Paynesville, Marlow, Gabo and Twofold Bay, the seaplane landed at Eden at 9 a.m. Some delay was experienced owing to the petrol refill not being available on time. However, the journey was resumed at noon, and Sydney was reached at 3.9 p.m. giving a total of about seven hours' travelling time.
>
> The seaplane was in charge of Flying Officer I. E. McIntyre, Wing Commander Goble acted as navigating officer, and a mechanic was included in the personnel.
>
> The seaplane will be used during the ensuing week in co-operation with the navy in exercises to be held in the vicinity of Jervis Bay.
>
> The journey of the seaplane was remarkable in that it is the first occasion on which a flight of this extensive nature has been made in Australia, and it is, of course, the first time that a seaplane has completed the journey along the coast from Melbourne to Sydney.
>
> The Minister for Defence stated to-day that very valuable assistance in reporting the flight of the seaplane was rendered by the Ports and Harbours and Lighthouse Branches, and he greatly appreciated their valued co-operation.

The Fairey Aviation Co. Ltd. state that the machine referred to is one of a batch of Fairey IIId Seasplanes supplied to the Australian Naval Air Service fitted with Rolls-Royce Eagle VIII engines. The machines are identical with those used by the R.A.F. in the recent operations in Chanak, Turkey and other places.

The original machine of this batch was launched by Dame Alice Hughes, wife of the Prime Minister, and on its trial trip carried Mrs. Coates, General J. E. B. Seely and Maj. Gen. Sir. W. S. Brancker, Controller-General of Civil Aviation.

Re-fuelling while Flying.

On Dec. 5 two French aeroplanes belonging to the 34th Aviation Regiment succeeded in transferring fuel from one to the other whilst flying. The experiment was carried out at Le Bourgêt by Capt. Weiss and Adjt. Van Caudenberghe at a height of 10,000 feet. Capt. Weiss lowered a supply pipe about 100 feet long to the other machine flying below and twelve gallons were transferred in about five minutes.

The process of re-fuelling aeroplanes while flying was used by Lieuts. Lowell Smith and Richter of the U.S. Army Air Service during their record duration flight of 37 hours. The practice was decried in the French Press, and it has since been suggested that for the purpose of making duration records re-fuelling whilst in flight should not be allowed.

With the present reliability of the modern aero-engine there would appear to be no rational limit to the duration record in so far as the aeroplane is concerned, but 37 hours seems to be the limit of human endurance, and the question of re-piloting an aeroplane brings back the "flirting with death" stunts that were prevalent in the United States a year or two ago. For the purpose of making records such performances would act as a serious deterrent to the progress of aeronautics and turn a perfectly serious attempt into a mere circus event.

The First Re-fuelling Accident.

On Nov. 18 during an exhibition of refuelling at the Army Relief Fund Air Carnival at Kelly Field, Lieut. P. T. Wagner was killed. Mr. Wagner was flying the refuelling aeroplane and during the operation of transferring the fuel to the other aeroplane, he lost height, causing the hose to slacken and some way got entangled with the right wings of both aeroplanes. The wings of Mr. Wagner's aeroplane were torn off and he crashed, receiving fatal injuries from which he died the same night. Lieut. W. R. Peck flying the other aeroplane landed safely.

Canada to Mexico with Re-fuelling.

On Oct. 25 Lieuts. Lowell E. Smith and J. F. Richter flying a D.H.4B special flew from the Canadian border to the Mexican border in 12 hrs. 13 mins. without landing.

They left Sumas on the Canadian border at 06.27 hours and while still flying took on 75 gals. of petrol at Eugene, Ore. A further 75 gals. were taken on at Sacramento.

They reached Tia Juana at 18.42 hours having covered the 1,280 miles in 12 hrs. 13 mins. During that time they consumed approximately 275 gals. of petrol.

They were using the same machine with which they broke the World's Duration Record, Aug. 27-28, 1923.

The Canada to Mexico flight was done non-stop without refuelling last year, so this flight appears to have been chiefly a refuelling stunt.

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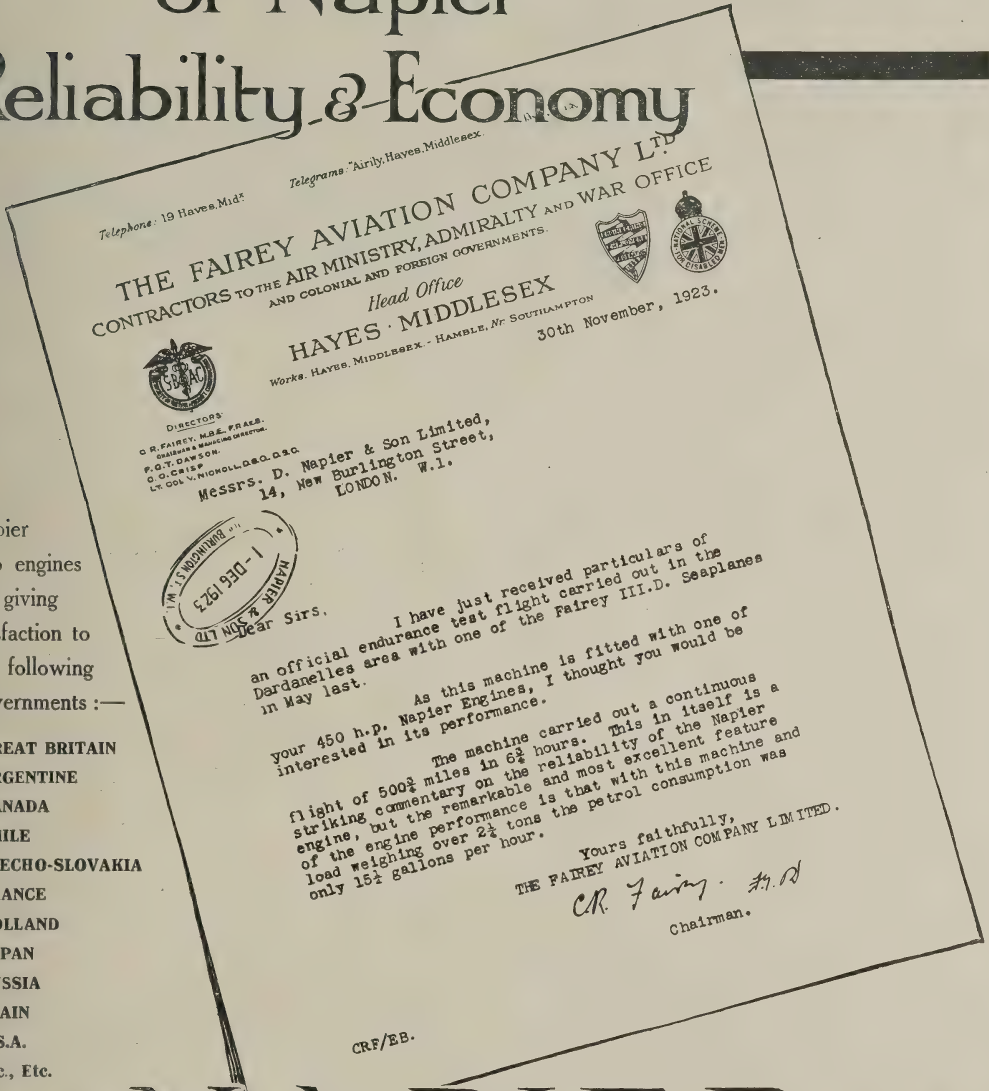

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30th November, 1923.

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Dear Sirs,

I have just received particulars of an official endurance test flight carried out in the Dardanelles area with one of the Fairey III.D. Seaplanes in May last.

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The machine carried out a continuous flight of 500¾ miles in 6¾ hours. This in itself is a striking commentary on the reliability of the Napier engine, but the remarkable and most excellent feature of the engine performance is that with this machine and load weighing over 2¼ tons the petrol consumption was only 15¼ gallons per hour.

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HUNGARIAN AVIATION.—This photograph, taken in the Spring of 1923, represents Count Mikes, Bishop of Szonmathely and his Secretary on their way to Rome to deliver an official report to the Pope. The machine is a Junkers belonging to "the Aero-Express Legiforgalmi Tarsasag." The flight from Budapest to Rome was made in 7½ hours, with one stop at Udine. The return journey took only six hours. The pilot, Joseph Maier, and his machine each received a silver medal in commemoration of the visit.

A New Service in the Argentine.

On Jan. 2 the Sociedad Rio Platense de Aviacion began a regular passenger and small service between Buenos Aires and Montevideo. The company is receiving a subsidy of 4,500 pesos (375) per month from the Post Office and the War Ministry.

The Sociedad Rio Platense is a purely Argentine company in so far as capital is concerned but the personnel and most of the equipment is British. For the Buenos Aires—Montevideo service Vickers Viking amphibians (Napier Lion engines) are being used.

Previously this service has been operated tentatively by the company without subsidy and with land machines but owing to the amount of time wasted in getting from the city to the aerodromes at either end, very little time was saved on the actual service. With the use of amphibian flying boats, the service operates from the North basin, Buenos Aires and the harbour at Montevideo which means that the service takes 1 hr. 30 mins. from hotel to hotel as compared with 2 hrs. 25 mins. by the former method, and all day by boat.

The manager of the company is Major Shirley Kingsley, late R.A.F., and the chief pilot is Major Brian Ferrand, D.S.O., late R.N.A.S. and R.A.F.

The equipment of the company, which also carries out a lot of pleasure flying, consists of Vickers Vikings, D.H.4s, H. Potez, Morane Saulnier and Dornier aeroplanes.

The varied collection is due to the fact that the Sociedad Rio Platense took over the equipment and the agencies of a French company which failed some two years ago. Up to the end of 1922 the company had carried 15,000 passengers and flown a total distance of 400,000 kilometres.

An Air Line to the East.

A meeting of Government authorities and aeronautical experts was held on Dec. 27 at the Chamber of Commerce, Milan, in connection with the establishment of an air line to link up Italy with the Levant.

The line is to be operated by an Italian company which has been formed with sufficient capital, and it will be supported by the Commissiato d'Aeronautica by means of a subsidy based on the miles flown and the cargo carried.

The line will operate at first, between Brindisi—Athens—Smyrna and Constantinople with the future extension to Alexandria and Cairo for connection with the Cairo-Baghdad service and also to the Black Sea countries.

Presumably the service will be operated entirely by flying boats.

An Italian Naval Aircraft Development.

Officers of the Regia Aeronautica, the new name for the Italian Air Force, at Montecello aerodrome are now practicing landing and flying-off the decks of ships.

For this purpose the Genio Aeronautica, or engineering section of the Regia Aeronautica, has built a special platform 150 metres long by 30 metres wide, in the form of the deck of a ship.

From this one may gather that Italy aspires to an aircraft carrier. It has been reported that a steamer of 4,000 tons is being adapted for use as a carrier, and that the work of conversion was put in hand at Spezia last year for completion this year.

Whether it will be an aircraft carrier in the true sense of the word without a flying-deck, or not, is not known, but one is inclined to assume that the practice flying at Montecello is being done with a definite object.

A Danish Air Line.

From Apr. 17 to Oct. 17, 1923, the Dansk Luftfartsselskab A/S. of Copenhagen, operated a service between Copenhagen and Hamburg with three D.H.9s (240 h.p. Siddeley "Puma" engines).

Of the 311 flights scheduled 304 flights were accomplished and only one flight was cancelled due to engine failure. A total of 89,480 kilometres were flown in 633 flying hours and 414 passengers and 6,399 kgs. of cargo and mail were carried making a total of 40,590 kgs. of commercial load.

The service is to be resumed this year.

Naples to Madrid.

On Nov. 5-7 a Junkers monoplane piloted by Herr Koscienlny flew from Naples to Madrid a distance of 1,750 kms. (1,094 miles).

He left Naples on the 5th and flew via Cagliari in Sardinia, Palma and Majorica to Barcelona. Here wheels were substituted for floats and the flight continued to Madrid where the machine arrived on the 7th.

Polar Exploration by Airship.

On Christmas day the plans for the exploration of the Polar regions by the U.S. rigid airship *Shenandoah* were made public by the Secretary of the U.S. Navy. The permanent base will be at Nome, Alaska, with auxiliary stations at Point Barrow and Spitzbergen together with two vessels equipped with mooring masts. The *Shenandoah* will fly from Lakehurst to Fort Worth, Texas, to avoid the Rocky Mountains, and then up to San Diego, and Puget Sound to Nome.

The expedition is to be made in June, July and August and is to be principally for reconnaissance purposes, although there is a possibility that an air route to the East over the Pole may be indicated. Six aeroplanes to be accommodated on the auxiliary vessels equipped with mooring masts will be used for aerological observations and will act as auxiliaries to the airship in surveying unknown land and finding suitable landing grounds.

Cooking Cox.

Mr. S. E. J. Cox whose presence in France during the 1920 Gordon-Bennett Race as the owner of the "Texas Wild-Cat" and the "Cactus Kitten," caused so much amusement, has been sentenced to serve eight years in prison and pay a fine of $8,000 for fraudulent use of the mails in connection with an oil investment scheme. His co-defendant in the case was Dr. Cook of Polar notoriety. Dr. Cook's tame Esquimaux, Ahwelch and Etukisuk have not figured in this case.

A New Italian Semi-Rigid Airship.

Work is in progress at the Stabilimento Construzione Aeronautiche for the construction of a new type of semi-rigid airship of 45,000 cubic metres capacity, which it is claimed will be the largest semi-rigid ship in the world. No information regarding her characteristics are known except that her range is estimated at more than 5,000 km. (3,127 miles) and that it is to be a civil airship.

A Long Flight in South Africa.

On Jan. 4 a South African Air Force aeroplane carrying as passenger a representative of the *Cape Times* flew from Cape Town to Pretoria a distance of over 1,000 miles in 10 hrs. 5 mins flying time.

This at any rate shows the advantage of an air mail service, as the fastest trains take something like 36 hours.

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> *Saturday Review*, 1/9/23.

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THE ROYAL AIR FORCE.

London Gazette.

War Office, Jan. 1.

The following Colonel to be Major-General, E. B. Ashmore, C.B, C M.G., M.V.O. (Jan 1).

Air Ministry, Jan. 1.

General Duties Branch.—Sq. Ldr. (hon. Wing Cdr.) G. H. Thomson, O.B.E. (Paymr. Cdr., R.N.), relinquishes his temp. commn. on return to Naval duty (Jan. 1).

Stores Branch.—Flg. Off. J. P Crichton is placed on the retired list on acct. of ill-health (Nov. 28, 1923) (substituted for the notifn. in the *Gazette* of Nov. 13, 1923).

Jan. 4.

General Duties Branch.—The follg. Air Commodores are promoted to the rank of Air Vice-Marshal, with effect from Jan. 1:—F. R. Scarlett, C.G., D.S.O., H. R. M. Brooke-Popham, C.B., C.M.G., D S.O., A.F.C. (substituted for notification in Supplement of *Gazette* Jan. 1).

Appointments.

General Duties Branch.—Air Commodore C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., to Air Ministry, 10/12.

Wing Commander A. S. Barratt, C.M.G., M.C., to R.A.F. Depot, whilst attending course at Staff College, Camberley, 21/1.

Squadron Leaders J. Kemper, M.B.E., to I.A.A.D., Henlow, 14/1; E. L. Tomkinson, D.S.O., A.F.C., to C. & M. Party, Cattewater, 7/1.

Flight Lieutenants C. B. Cooke, to No. 60 Squadron, India, 12/12; W. H. Ellison, to Aircraft Depot, India, 21/11; H. P. Lloyd, M.C., D.F.C., to School of Army Co-operation, Old Sarum, 13/1; C. F Brewerton, D.S.C., to R.A.F. Base, Gosport, 13/1; L. G. Harvey, to No. 1 School of T.T. (Boys), Halton, 13/1; C. H. C. Woollven, M.C., to I.A.A.D., Henlow, 14/1; Hon. R. A. Cochrane, A.F.C., to Boys' Wing, Cranwell, 14/1; C. B. Dick-Cleland, to No. 12 Sqdn., Northolt, 1/2; C. R. Keary, to No. 25 Sqdn., Hawkinge, 14/1; S. E. Adams, to R.A.F. Depot (Non-effective Pool), 1/1; V. A. Albrecht, O.B.E., M.C., to No. 111 Squadron, Duxford, 21/1; P. L. Plant, to R.A.F. Depot, 15/1; R. M. Foster, D.F.C., to R.A.F. Base, Gosport, 13/1; G E. Livock, D.F.C., to C. & M. Party, Cattewater, 7/1; C. McM. Laing, M.C., A.F.C., to R.A.F. Depot, 14/1; J. A. Boret, M.C., A.F.C., to No. 100 Sqdn., Spittlegate, 14/1; R. Jope-Slade, D.S.C., to Armoured Car Wing H.Q., Iraq, 24/4; A M. Wray, M.C., A.F.C., to Aeroplane Exper. Estab, Martlesham Heath, 14/1; B A. Malet, D.F.C., to No. 2 F.T.S, Duxford, for course of instruction, 14/1; R. W. G. West, to R.A.F. Depot (Non-effective Pool), 17/12.

Flying Officers L. A. C. Stafford, to No. 2 F.T.S., Duxford, for course of instruction, 14/1; G. R. O'Sullivan, to I.A.A.D., Henlow, 1/1; C. B. Greet, to No. 32 Sqdn., Kenley, 4/1; W. C. P. Bullock, N. C. Ogilvie Forbes, F. H. Woolliams, and A. F. Lingard, to R.A.F. Base, Leuchars, 4/1; H. R. Vaughan Fowler, to R.A.F. Base, Leuchars, on appointment to a S.S. Commn., 29/12; W. V. Simons, to R.A.F. Depot, pending disposal on transfer to Home Estab., 19/1; E. J. Ffoulkes-Jones, to No. 2 F.T.S., Duxford, 14/1; D. R. Mitchell, M.B.E., to Marine and Armt. Exper. Estab., Isle of Grain, 14/1; G. J. Stroud, M.B.E., to No. 1 S. of T.T. (Boys) Halton, 14/1, S. Upton, to I.A.A.D., Henlow, 14/1; O. E. Carter, to No. 27 Sqdn., India, 9/12; L. W. Park, to No. 6 Armd. Car Co., Iraq, instead of to No. 4 Armd. Car Co. as previously notified, 14/9; E. P. M. Davis, A.F.C, A.M., F. H. Isaac, D.F.C., A. J. Rankin, and H. A. D. Dinnage, to C. & M. Party, Cattewater, 7/1.

Pilot Officers K. R. Brown, to No. 25, Sqdn., Hawkinge, 4/1; C. W. A. Byrne, to No. 29, Sqdn., Duxford, 4/1; C. F. Roupell, to No. 7 Sqdn., Bircham Newton, 4/1.

Medical Branch.—Squadron Leader (Medical) R. A. G. Elliott, M.B., B.A., to H.Q., Palestine, 10/12.

Flight Lieutenant (Medical) W. Parsons to No. 1 School of T.T. (Boys), Halton, 2/1; L. G. Howell, to Research Laboratory and M.O.S. of I., Hampstead, on appointment to a S.S. Commn., 31/12; A. F. Rook, M.R.C.P., D P.H., to remain at R.A.F. Central Hospital, Finchley; M. Coghlan, M.B., to remain at School of T.T. (Men), Manston, instead of to R.A.F. Depot, as previously notified.

Flying Officer (Medical) R. W. White, to remain at R.A.F. Hospital, Cranwell.

Flying Officer (Dental) G A Ballantyne, D.F.C., to R.A.F., on appointment to a Temp. Commn. on attachment from the Army, 1/1.

Stores and Accountants' Branch.—Flight Lieutenant (Stores) W. G. MacD. Nicholl, to Armt. and Gunnery School, Eastchurch, 14/1.

Flying Officer (Stores) W. A. Glasper, to Aircraft Depot, India, 9/9.

A Home Defence Area.

It is now known that (as guessed in The Aeroplane last week) Air Marshal Sir John Salmond is coming home from Iraq to organise and command the Home Air Defences. Apparently a fresh Air Force Area is to be formed to be called the "Home Defence Area." This will be bigger than either the Inland or Coastal Areas and will therefore be suitable to an officer of Sir John's rank. All will wish him and the R.A.F. success in this first step towards the great Air Force of the future.

The Staff College.

The following officers of the R.A.F. have been nominated for admission to the Staff College (Camberley) under paragraph 2, Staff College Regulations 1921. Wing Cdr. A. S. Barratt, C.M.G., M.C. and Sq. Ldr. S. W. Smith, O.B.E.

New Aircraft Carriers.

According to the *Morning Post* of Jan. 8, it has been announced at Devonport that the cruisers *Glorious* and *Courageous* are to be converted into aircraft carriers.

The *Morning Post* says:—

"In the case of the *Glorious*, the conversion will be done at Rosyth. The *Courageous* will be converted at Devonport dockyard. The work will be heartily welcomed at both yards.

At present the *Glorious* is the ship of the Senior Officer, Reserve Fleet, Devonport. She is a vessel of 18,600 tons, and her armament includes four 15-inch, and eighteen 4-inch guns.

The *Courageous*, which is the ship of the Vice-Admiral commanding the Reserve Fleet, is of the same tonnage and armament as the *Glorious*.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

No. 28 Squadron, Peshawar.

Resumé of Sports held during the months of October and November, 1923.

Football.—28 Sqdn. R.A.F versus Gymkhana Club, at home, draw 1—1; "E" Divl. Signals, away, lost, 4—0; Islamia College, away, won 6—0.

2nd XI, 28 Sqdn. R.A.F., versus Army Repair Workshops, at home, won 6—0.

28 Sqdn. R.A.F. versus 34th M.T. Co., at home, lost 2—0; "E" Divl. Signals, home, won 3—2; R.A.F. Station, Risalpur, at home, draw 1—1; Tank Corps, away, won 5—0; 37th Bty. R.F.A., away, lost 2—0; Islamia College, away, won 6—0, Border Regt., at home, won 3—1.

In addition to the above matches an Inter-Squadron Competition was held between Nov. 27 and Dec. 5 for the "Briscoe Cup," presented by Flt. Lt. A. Briscoe, M.B., late Medical Officer to this Unit. Each Flight played one another twice, 2 points being given for a win and one for a draw The following result was obtained:—"C" Flight, 7 points (winners); "B" Flight, 3 points; "A" Flight, 2 points.

Great keenness was shown throughout the above competition, but special mention is made of the matches between "B" and "C" Flight, both teams giving of their best up to the last minute of the two matches played.

THE WINNERS OF THE IRAQ POLO TOURNAMENT.—No. 55 Squadron's team which after travelling 500 miles beat No. 30 Squadron in the final, fourteen teams of Army, Air Force and Iraq Levies having competed. This is the first time an R.A.F. Unit has won a polo tournament. The team, reading from left to right, are:—Flg. Off. A. D. Page, M.M., Flt. Lt. F. L. C. Butcher, Sq. Ldr. A. Coningham, D.S.O., M.C., D.F.C., and Flg. Off. G. Horsfield.

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HOCKEY.—28 Sqd. R.A.F. versus "A" Co. Border Regt., away, won 2—1; 37th Bty. R.F.A. at home, won, 4—2; Islamia College, away, lost, 3—2; Islamia College, at home, won 2—0, "A" Co. Border Regt., at home, won 4—0, Islamia College, away, draw, 2—2; District H.Q., at home lost 3—0; 7th (M) Bty. R.G.A., away, lost 5—2; Islamia College, won, 2—1; 1st/2nd Punjab Regt., at home, lost 4—1; 8th K.G.O. Cavalry, away, draw, 4—4; "A" Police team, away, draw, 3—3; R.A.F Station, Risalpur, at home, draw, 1—1.

In addition to the above, several Inter-Squadron matches have been played, with a view to running a hockey second eleven.

Boxing,

A Boxing Match between Teams representing the Boys' Wing, Cranwell, and No. 1 School of Technical Training (Boys), Halton, took place at Cranwell on Dec. 15.

Nine Junior Contests and Nine Senior Contests took place. The Boys' Wing, Cranwell, won the Junior Match by five contests to four, and the Senior by six contests to three. The results of the contests were:—

Junior Events (confined to Aircraft Apprentices under seventeen years of age).—*Paper Weights*: Burke (Cranwell) beat McCheyne (Halton). *Fly Weights*: Sherwood (Cranwell), walk over. *Bantam Weights*: Maher (Halton) beat Wareham (Cranwell). *Feather Weights*: Pretty (Cranwell) beat Polling (Halton). *Light Weights*: Molsley (Cranwell) beat Carew (Halton). *Welter Weights*: Aspin (Halton) beat Easton (Cranwell). *Middle Weights*: Bailey (Cranwell) beat Coase (Halton). *Light Heavies*: Bogley (Halton) beat Cornhill (Cranwell). *Heavies*: Lewes (Halton) beat Stoneman (Cranwell).

Senior Events (Aircraft Apprentices over seventeeen years).—*Paper Weights*: Sargeant (Cranwell) beat England (Halton). *Fly Weights*: Rose (Halton) beat Greenwood (Cranwell). *Bantam Weights*: Pitman (Cranwell) beat Hill (Halton). *Feather Weights*: Bray (Cranwell) beat Gauley Halton). *Light Weights*: Woodford (Cranwell) beat Panco (Halton). *Welter Weights*: McCreeth (Halton) beat Proctor (Cranwell). *Middle Weights*: Ferres (Halton) beat Scott (Cranwell). *Light Heavies*: Wilson (Cranwell) beat White (Halton). *Heavies*: Mounsey (Cranwell) beat Breakspear (Halton)

At the conclusion of the Match Air Commodore A. E. Borton, C.B., C.M.G., D.S O., A.F.C., presented the Cup and Medals to the winners and remarked on the excellence of the boxing, which had been witnessed that evening. Sq. Ldr. J. F. Parkin, M.B E., officiated as Judge, while the Rev. H. D. L. Viener, O.B.E., M.A, Chaplain-in-Chief, and Flt. Lt. H. E. Walker, M.C., D.F.C (Kenley), officiated as Judges.

Cricket in Iraq. *(Unofficial.)*

A cricket match was played on Nov. 28 and 29 and Dec. 1 at Baghdad between the Army and the R.A.F. and resulted in a draw in favour of the R.A.F. The Air Force made 101 and 405, Cpl. Higgins batting well for 136, the top score. The Army scored 130 and 268 for 8 wickets.

Discipline versus Initiative.

Although the Air Ministry expressly stated that applications for the new short service commissions must be made in writing over 100 would-be officers applied in person to the Ministry on the day that the announcement was made.

Although these applicants showed lack of discipline in not following instructions they undoubtedly showed initiative, a quality all too rare at any time anywhere.

One is reminded of the story in which the manager of a big business concern advertised for an office-boy. About 100 applicants appeared on the morning of the interview. One boy at the end of the queue sent in a note to the manager which read,—"If you will see me first it will save wasting your time and mine, both of which are valuable." He got the job.

CHRISTMAS~
1923~
PESHAWAR
INDIA~

ARDUA ET ASTRA.—A Greeting from No. 28 Squadron.

The South African Air Force.

The Nonqai, the magazine of the South African Forces, in the South African Air Force section, states that the third special course for ex-R.A.F. pilots is in progress, and points out the fact that of the 22 pilots under instruction, seven have been found unsuitable is a justification for these courses.

Highly satisfactory results have been attained in Artillery and Air Force co-operation at Potchefstroom. Attention is called to the fact that from the Artillery point of view there are no maps in South Africa and therefore special means of co-operation have had to be devised and perfected.

The Director of Air Services, Colonel Sir H. van Ryneveld, has been appointed a member of the Civil Air Board.

The following is an extract from an order issued by H.R.H the Governor-General at Potchefstroom on Oct. 24:—"The Air Service played a most important part in the manœuvres—their contact patrol, and observation work being extremely efficient and of great value to the attacking Force. The Airmen are worthy of special praise for the thoroughness with which they carried out their arduous duties for three hours continuously under very bad flying conditions."

Colonel Templer, Pioneer.

The death is announced of Colonel James Lethbridge Brooke Templer, late King's Royal Rifle Corps, on Jan. 2, at Laughton Grange, Lewes. He was born in 1846 and was educated at Harrow and Trinity College Cambridge. Colonel Templer was formerly Superintendent of the Balloon Factory at Farnborough, and may be regarded as the founder of British Military Aeronautics. He, together with Captain Watson, started the first Army Balloon School at Woolwich in 1878. From it developed in succession the Balloon Factory, the Royal Aircraft Factory and the present Royal Aircraft Establishment.

The present generation of aviators knew not Colonel Templer. Those who were concerned with flying in 1909-10 or thereabouts will remember him as a tall burly personage with a white moustache a gruff manner and a grim sense of humour who appeared at full-dress debates of the Aeronautical Society and at similar functions.

Major C. C Turner, one of the true pioneers of aviation, writing in the *Daily Telegraph* recalls how he first saw Col. Templer ascend in a captive observation balloon at a Volunteer Review on Brighton Downs at Easter 1880, what time a cavalry regiment charged in all the glory of brass helmets, plumes and scarlet kit—truly a glimpse of ancient history.

Personally one first met him in 1909 when the old Balloon Factory, then under Col. Capper, still told stories of the Templer command. For example there was the famous yarn of how the Colonel carrying a large parcel met an R.E. subaltern on the balloon ground and explained that the parcel contained a new type of parachute just sent to him from France to try He suggested that the subaltern might like to try it by dropping himself out of a balloon. The subaltern, brave but apprehensive, asked the Colonel what would happen if the parachute did not open. The Colonel replied that the makers guaranteed that it *would* open. "But Sir," persisted the subaltern, "supposing is *doesn't* open." "Well! In that case," replied the Colonel, "they'll have to give me a new parachute."

Colonel Templer did much to improve the compression and storing of hydrogen in cylinders and the handling and sticking of goldbeaters' skin (then the only balloon material) and to establish mechanical transport—in those days consisting only of steam traction-engines. So early as 1884 he sent three observation balloons with Sir Charles Warren's expedition in Bechuanaland. In 1885 he himself took three balloons to the Soudan, their transport consisting of traction engines rescued from the R.E. scrap-heap at Chatham and re-conditioned by the balloonatics—as his corps was jeeringly called. By 1893 the balloon corps was firmly established and its traction engines so enlightened the War Office that the foundation of Military Mechanical Transport as we know it to-day may be ascribed to Col. Templer as well as the foundation of Military Aeronautics.

In 1900 three balloon sections went to the South African War and did notably good work against General Cronje at Paardeburg.—It was their operations which inspired those remarkable air stories of artillery control and of bridge bombing which were written in "The Green Curve" just after that war by General Swinton long before anybody ever flew.—At Fourteen Streams one of the balloons worked for thirteen consecutive days. And simultaneously a fourth balloon section went to overlook the Boxer Rising in China.

Colonel Templer was also concerned, when the Balloon Factory was established at Aldershot, with developing man-lifing kites—the most primitive and dangerous of heavier-than-air craft. In this he was assisted by the late S. F. Cody, who disputed with Mr. A. V. Roe the distinction of being the first man to make an aeroplane fly in England. From kites came the aeroplane, and from a combination of the captive spherical balloon (only usable in a calm) and the kite (only usable in a gale) came the kite-balloons which did such good work over land and sea in 1914-18.

Also he was responsible for beginning the work on the very first Army airship, the Nulli Secundus, which was completed by Col. Capper and Mr. Cody and flown over London in 1907. The manuals of ballooning produced under his command by Capt. Ward were still used by the K.B. and airship people early in the War 1914-18.

The British Empire owes much to Colonel Templer for his work as a pioneer of aircraft. Though that work was not rewarded by titles or wealth he had the satisfaction of living to a good old age in which he saw the fulfilment of the beliefs which he had held and for which he had laboured. To few men does Fate grant so much.—C. G. G.

Telegrams: "Sunningend, Cheltenham." Telephone: 1162-3-4 Cheltenham.

Aerial Derby Cup, 1921.

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Aerial Derby Cup, 1922.

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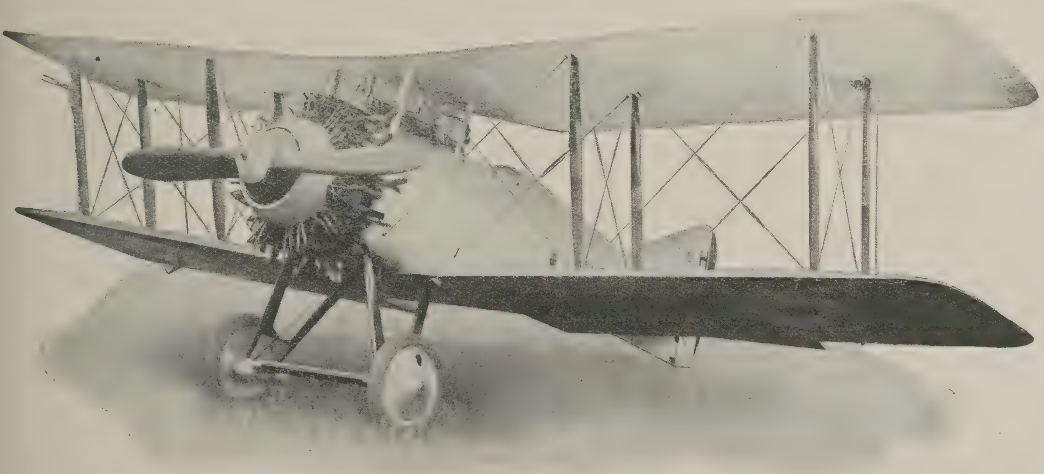

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" " " " "	1922	"	179·5	M.P.H.
" " " " "	1923	"	192·4	M.P.H.

HOLDERS OF BRITISH RECORD 212·2 M.P.H.
RECORD CLIMB OF 19,500 FT. IN 11 MINS. 34 SECS.

THE PSYCHOLOGY OF AIRCRAFT DESIGN.

The design of aircraft it has been said by one of our most scientific designers is still more of an art than a science. There is undoubtedly a good deal more truth in this remark than some authorities are willing to admit, and a general recognition of the fact on the part of those who are ready to attribute all the woes from which the British Aircraft Industry suffers to neglect of scientific research work would do a great deal of good. There is always an element of art in any design work worthy of the name, and no amount of purely scientific knowledge can by itself make a man a competent designer.

This is in no way to be taken as disparaging the value of scientific knowledge on the part of the designer. Such knowledge is of extreme value—but something more than this is necessary. It is extremely difficult to define precisely what this particular something else is which enables one man to produce a sound and practicable design where another of possibly vastly greater scientific knowledge can produce no design worth the paper to which it must be committed, or the waste-paper basket which should be—though it often is not—its immediate destination. It is possible to coin phrases to specify this quality—but in the end it defies analysis. Probably it is the capacity to start right.

HOW NOT TO DESIGN.

One gentleman at one time a power in the world of aeronautics, who undoubtedly possesses vast knowledge and in certain respects much common sense, distinguished himself as a designer by producing a certain number of the most outrageous aircraft that have ever existed. His failure as a designer was explained by one who had worked in close collaboration with him in the following terms :—

"If . . . were set to design a new pier for Southend he would start by detailing the turnstiles and work from thence to the pier-head."

Now one might possibly produce a tolerable pier—as piers go—by such methods, though it would not be likely to be the best possible pier, and certainly it would be likely to be an expensive pier. Essentially design—in the broad sense—is the production of the idea for a finished whole. The ability to design does not consist in the ability to deal with component details so much as in the ability to produce—before the details are in any way settled—a general scheme for the finished whole into which all the necessary details can be satisfactorily incorporated.

In the case of aeroplanes the capacity to visualise the completed machine with a very fair degree of accuracy in the earliest possible stages of design is of the greatest possible importance.

GUESSING IN DESIGN.

Generally speaking it is required to produce an aeroplane which will carry a defined load, and have a defined performance. A particular engine may or may not be specified. In any case the designer has to estimate—which is really only a polite expression for guess—a total loaded weight for the machine before he can go further. Having done this he can look into the question of wing area, etc., and will then probably lay out a provisional general arrangement for the machine.

Thereupon he has to estimate with a fair degree of accuracy the weights of component parts of the aircraft in order to discover whether or not that particular general arrangement will permit him to balance the aircraft satisfactorily. When what promises to be a satisfactory general arrangement has been achieved, he will probably proceed to make an estimate of the performance in order to make certain that this shall be up to specification.

And not till then will the design of the details begin.

Now if it is assumed that the detailed design is carried out in the most perfect manner, the whole success or otherwise of the design depends on the accuracy of the preliminary assumptions or guesses, which preceded detail design. Take the guess as to the total loaded weight. This guess may prove in the end to be reasonably accurate. In this case the machine should perform as the designer intended it to.

THE INFLUENCE OF WEIGHT ESTIMATES.

If it is inaccurate in either direction the effect of faulty estimating is detrimental to the efficiency of the completed machine.

The design of the structure of the aeroplane is based—so far as strength is concerned—on the estimated weight. If the weight is guessed too high—that is the machine when finished is lighter than had been estimated—it will be throughout stronger and therefore heavier than it need have been. It will presumably therefore have a larger wing area than it need have had and therefore will be still further heavier.

If the weight has been guessed too low then the machine will not be up to the designed strength when carrying its intended full load and will require either to be strengthened —which will increase the weight and impair its performance, or it must be used carrying less than its originally intended load.

The effect of faulty weight-guessing is therefore cumulative. If the finished weight is lower than the estimate it is evidence that with more accurate guessing the weight could have been still further reduced. If the finished machine is over-weight that finished weight is still less than the correct weight for that particular design.

But accurate guessing of what the finished weight will be is not in itself evidence that all is as it should be. With experience it is fairly easy to guess with sufficient practical accuracy the finished weight of a machine built to a fairly standardised design by fairly conventional structural methods. It does not follow therefore that all the material built into the machine has been used to the best advantage, and that therefore the machine is—so far as weight is concerned—as good as possible. To produce the perfect aeroplane—perfect structurally that is—the designer must guess accurately the weight corresponding to the best possible distribution of structural material, and then secure the accuracy of the guess by using the material in the right way. In regard to this part of the proceedings a scientific knowledge of the mechanics of structures and the qualities of materials is essential—but that knowledge by itself will not produce a good structural design unless the basis of that design—which ultimately is the weight estimate—is accurate.

STATISTICAL GUESSING.

It may be objected by some that the estimating of weights is not correctly to be described as guessing. There is now in existence a large amount of accumulated data as to the weights of successful types of aeroplanes, and by a process of analysing and tabulating such data it is possible to arrive at fairly accurate figures for the weights of various items of the structure and so forth of modern aircraft and from such data any normally intelligent person should be able to produce safe estimates for a new design. There is of course something in this.

No designer in his senses will refuse to be guided in his guessing by already existing experience. But statistics as to what has already been done—however complete they may be—by themselves will not allow one to improve on what has been done before. One may take average statistics for average machines and base estimates on those. Then one will certainly not produce anything much above the average in quality.

One may work from the best achieved figures—and if in all details the resulting design is up to the standard of the previous best one may equal it. But if it is desired to improve on the previous best, there is nothing for it but to guess by how much one can beat it. Obviously successful guessing of this type is not blind guessing—it must have a rational basis in the form of a fairly clear idea of how and where the improvement is to be attained, but there is a very distinct element of speculation about the process. It is necessary to estimate the total result of the design work with a very high degree of accuracy before that design work is commenced, and if one hopes to design better machines than have already been produced it is necessary to go beyond the limits of previous experience in that estimate.

THE IMPORTANCE OF OPTIMISM.

There is one distinctly interesting point to be noted in this connection and that is that optimism is a necessary ingredient of the designer's equipment. If a designer starts off with a pessimistic weight estimate, the resulting design must of necessity be heavy—for the structure will be designed to carry an unnecessarily large load.

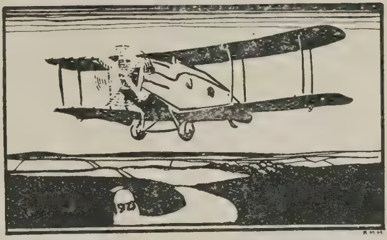
Undue optimism is of course undesirable, and may even be more disastrous than pessimism—but optimism is more likely to lead to strikingly successful design than is any degree of pessimism. The really gifted designer therefore must be a man with confidence in his ability to improve on the designs of others together with the ability to justify his own confidence. There are plenty of people with the first quality who would make extremely unsatisfactory designers. There are plenty of people possessed of all the technical knowledge necessary to do all the detail of design provided they are given the necessary basic data from which to work. There are comparatively few people who combine the two qualities in just the right degree to entitle them to be considered really gifted designers.

Weight estimates are of course not the only guesses that have to be made before definite detail design work can be undertaken. But the influence on the whole of the subsequent work of design of the original weight estimate is so direct and so obvious that it has been chosen to illustrate the dependence of design on the designer's prophetic abilities, rather than any of the other factors on which the same quality has to be exercised.

It should be clear, if the above elementary analysis of the

MILESTONES

1823



1923

LEADING TO WESTLAND

Thomas de Quincey in his "Confessions of an English Opium Eater," gives a striking picture of the English Mail Coach, the principal means of conveyance a 100 years ago. He says:—

> "The condition of the roads was then such, that, in order to face it, a corresponding build of coaches hyperbolically massive was rendered necessary; the mails were upon principle made so strong as to be the heaviest of all carriages known to the wit or the experience of man; and from these joint evils of ponderous coaches and roads that were quagmires, it was impossible for even the picked breed of English-coach-horses, all bone and blood, to carry forward their huge tonnage at a greater rate *than six-and-a-half miles an hour.*"

1823	1923
6½ miles per hour Maximum.	***90 miles per hour Aircraft Cruising Speed.***

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YEOVIL — SOMERSET.

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Telegrams: Aircraft 141 Yeovil.

processes of design is accepted, that a designer—like any other artist—cannot do the best work unless the work appeals to him as likely to be successful. If he starts off with discouraging estimates the result is likely to justify the estimates.

Nor is a really good designer likely to do his best work under severe restraint or control from outside sources. It is this fact that makes the present Air Ministry control of design so inimical to progress in aircraft design.

The majority of the supposed authorities on aeronautical science and technique in this country are it appears somewhat statistically-minded persons. They appear to regard aircraft as having settled down to a state of development in which it is safe to assume that the performance, or the weight, or any other quality of the best possible aircraft can be estimated with sufficient accuracy from a set of average curves based on existing practice. The Air Ministry in practice has adopted this belief and has constituted a Technical Department which is in effect a committee of averagemongers whose business it is to see that no designer shall depart seriously from standard practice and therefore that no aircraft shall be appreciably better than the present regrettably low average standard.

When in spite of their efforts a designer does succeed in producing a machine in any way abnormal, instead of encouraging the said designer to see how much further he can go, they seek for dubious explanations in the wind-channel or other unlikely spots, in the hope that thereby they will be able to reproduce what is in fact a result of the individual designer's personal gifts.

Research work—intelligently conducted—is of the greatest possible value but it will suffice to produce good aeroplanes only when its results are applied by men who have the mental qualifications necessary for practical design work. When our knowledge of aeronautical science is sufficiently advanced to make it possible to calculate the components of a satisfactory aeroplane there will be no need for aeroplane designers, but at the present moment a little research into the qualities which are necessary in designers might do more for aviation than the Air Ministry or the Aeronautical Research Committee might imagine.

Cloud Flying.

Sir,—The letter from Major Hemming in your last issue raises several points with which I am not in agreement. In so far as his comments on commercial pilots are concerned, his remarks strike me as purely ridiculous. To say "I believe that most commercial pilots in these days appreciate that aeroplanes can be flown in and over clouds" is a most ungenerous and unfair remark. The truth of the matter actually is that as far as I know commercial pilots of to-day they are a most fearless collection, well accustomed to cloud flying and willing at all times to undertake it, and that the work done in this direction by certain notable pilots is beyond criticism. If your correspondent were a passenger on the air line in which I am working he would find this to be the case—I am quite sure

I cannot imagine the object of his remark, which seems to me merely a cheap gibe, without any grounds for making it. Everyday performances of pilots can be ascertained from independent authorities—e.g., the Duty Office at Croydon and the Air Ministry Wireless at Croydon and Pulham, who are frequently occupied in giving bearings and positions by wireless to pilots who are in the clouds or above them.

Your correspondent's other remark that "the reason why they do not fly above fog," etc., etc., is an assumption based on a false premise—Commercial Pilots frequently fly in fog and above fog and I can give you a notable instance recently in which Barnard of Instone's left Croydon in a thick fog relying purely on wireless direction finding to guide him to where he knew the weather was clear—90 miles away.

Let me assure Major Hemming that pilots now flying commercially need no assistance or urging from him or anyone less knowledgeable to equip them fully for cloud flying I suggest further that there was room in his letter for a little appreciation of the work actually being done in that direction to-day

I am afraid that there is one rather important instrument which he has omitted from his list of those required for cloud flying, namely the height indicator. Perhaps he would not use this himself in an experimental flight in a big cloud which he knew was several thousand feet up, but I fear it is a sad necessity for Commercial Pilots who, moreover, fully appreciate its uses. None the less they all undoubtedly understand the dangers of using it blindly without some means of ascertaining the height of the ground underneath them.

The need for an instrument to give such information is very great and perhaps the scientific professor mentioned will duly oblige. It is in a measure not impossible to follow the ground contours from above, partly by reason of the fact that cloud and land contours are often similar, partly because a good pilot also is a good course and distance calculator by instinct and (this being the secret of all successful route flying) he knows his country by heart, he knows what weather to look for in which winds and consequently chooses a course to suit the weather of the moment.

Personally before aperiodic compasses and static turn indicators came along and without any assistance from Orfordness I managed to get in a good deal of accurate cloud flying in the war, and I remember incidentally that the Germans taught us the value of cloud-manœuvres quite early on. There is not time or space to give instances but I could do so—*ad lib.*

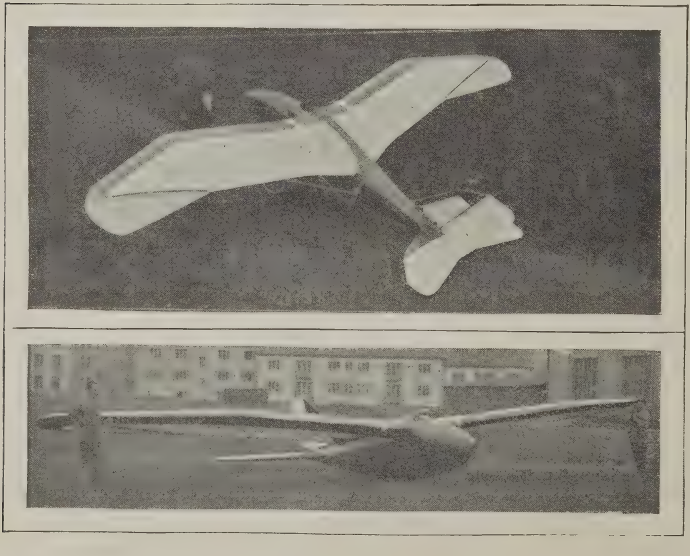
May I add one word about cloud and fog flying?

On long-distance flights to-day, with a reliable machine and engine or engines, local clouds or fogs are of no account and are no obstruction to any good pilot. (See performances on air routes to-day.) It is quite a simple matter to go blindly ahead through even 100 miles of invisibility if you know it is clear ahead. But to go at present-day speeds (about 80 m.p.h. minimum loaded) barging into or towards an aerodrome at which visibility is nil is the height of folly. The former is done every day, the latter is not attempted by sensible pilots. One does not even motor much in thick fog where divergence from one's course cannot exceed half the width of the road. What can one expect of flying in fog with visibility *actually* nil? Only disaster, naturally.

If people insist on flying in "impossible" fogs, let them have helicopters, unlimited rockets and wireless which is really efficient and the thing is easy. Until that day comes I shall content myself with my present limit—visibility about 500 yards—and I think most people will agree.

Naturally reducing the minimum flying speed will help greatly but to suggest as your correspondent does, that there exists any difficulty in balancing a machine in clouds or fog is quite absurd, and a letter like his, in my opinion, completely and most unfairly misrepresents actual working conditions in Commercial flying as they exist to-day.

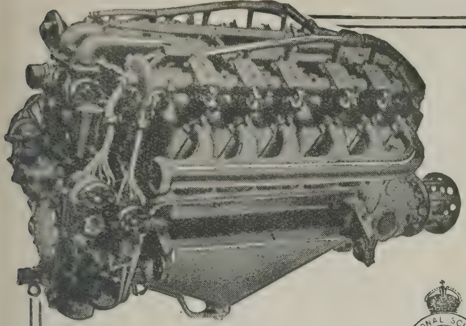
(Signed) G. L. P. Henderson.



The Aachen K.E. type glider, designed by Klemperer and built by the Aachener Flugzeugbau of Aachen. This machine which has performed extremely well resembles the recently illustrated and described Klemperer Light Aeroplane in wing form. The machine has a span of 13.15 m. (43 ft 2 in.) is 5.6 m. (18 ft. 8 in.) long, has 15.2 sq. m. (163 sq. ft.) wing area.

The machine lands on a central skid which is sprung by a motor-cycle inner tube sandwiched between the skid and a keel member of the fuselage.

The wheeled undercarriage which can be discerned in the upper photograph is a detachable transport carriage.



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We can supply from stock new Rolls-Royce Engines of the well-known "EAGLE VIII" and "FALCON III" types together with spare parts.

EXTRACT from letter we have received from HANDLEY PAGE TRANSPORT LIMITED, dated 5th December, 1923.

"EAGLE VIII" Engines.

"This type of engine is now used exclusively on our air services between London, Paris, Basle and Zurich.

In the period from the inception of the Handley Page Air-Services in 1919 to the present date, 17,000 "EAGLE" engine hours have been flown, approximating 1,360,000 engine miles.

In the period October, 1922 to September, 1923, 5,070 hours were flown, representing 431,000 engine miles, with an engine efficiency percentage of 98.5.

We have now on our charge twenty-eight engines, and the total running time of these engines is 9,500 hours. Six of these engines have each over 500 hours to their credit, as follows, and are still in service:

ENGINE.	HOURS.
8E.3164	790
8E.3704	670
8E.3076	640
8E.2672	611
8E.5224	516
8E.3046	506

All the above flying hours have been carried out with engines supplied to ourselves by the Aircraft Disposal Company."

EVERY ENGINE BEFORE DESPATCH FROM OUR WORKS, IS DISMANTLED FOR INSPECTION, AND AFTER RE-ASSEMBLY IS GIVEN A TEST RUN.

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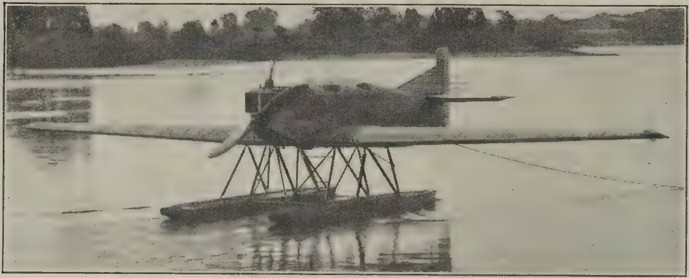


A new Junkers Seaplane, known as the type A, fitted with a 160 h.p. Mercedes engine. The machine is of the open type, and very closely resembles in appearance a machine turned out by the same firm at the end of the war.

The forest of undercarriage struts which are used scarcely seems to be in keeping with the clean design of the remainder of the machine.

Pioneering Aviation.

A particularly interesting paper is to be read before the Institution of Aeronautical Engineers on Friday, Jan. 11, by Mr. R. L. Howard Flanders, M.I.Ae.E., A.M.I.M.E., A.F.R.Ae.S., the Honorary Secretary of the Institution, to whom incidentally great credit is due for the liveliness and success of this young association. Mr. Flanders' paper is entitled "Reminiscences of the Early Days of Aviation at Brooklands."

Having been favoured with an advance copy of the paper one can guarantee that it will entertain not only the old timers of aviation because of its reminiscences but also the younger generation of engineers because of the exposition it will give of the difficulties under which the pioneers of aviation laboured. It is earnestly hoped that many of the old timers will attend the meeting and will give some of their own experiences of thin times.

The meeting will be held at the Engineers' Club (formerly the Motor Club) at the corner of Coventry Street at 6.30 p.m. Tickets of admission may be obtained from the I.Ae.E., 60, Chancery Lane, W.C.2.

A Fine Combination.

One of the most remarkable features of the aircraft trade during the last year or two has been the success of that pioneer firm, The Blackburn Aeroplane & Motor Co. Ltd., in producing some of the most effective torpedo-carrying aeroplanes which have yet appeared. It is unusual for pioneers to succeed in anything, but Mr. Robert Blackburn, having had the business acumen to acquire the co-operation of Major Bumpus, has certainly achieved the success which his initial enterprise deserved.

It has recently been announced that the Air Ministry has shown still further confidence in the Blackburn Company by allocating to it the establishment and operation of a seaplane station for the R.A.F. Reserve at Brough on the Humber. The unfortunate experience of the Blackburn Pellet at Cowes did not exactly inspire confidence in this proposition, but any doubt which has existed in the future of the Blackburn flying-boat branch may now be dispelled by the announcement that the firm secured some time ago the services of Major J. D. Rennie who knows about as much about the design, construction and operation of flying-boats as anybody in this country.

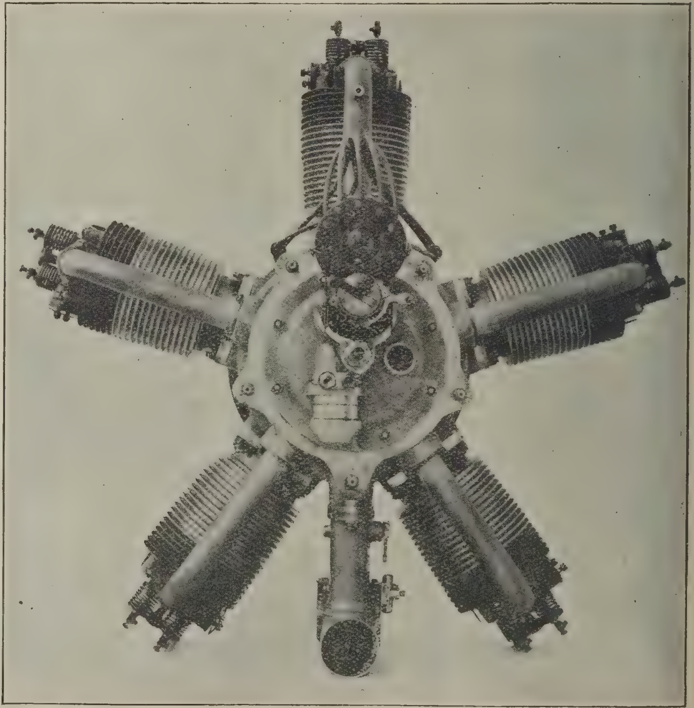
Major Rennie was a pre-war engineer and spent most of his time during the War at Felixstowe with the late Colonel John Porte. It was he who was primarily responsible for the engineering work of the Porte flying-boats, commonly known as "F-boats" from having been produced at Felixstowe. They became the standard basic design for all the twin and multiple-engined flying-boats of the World. Since the end of the War 1914-18 Major Rennie has continued to devote himself to the purely engineering side of aircraft and is thoroughly conversant with all Air Ministry requirements, having been in the employ of the Air Ministry most of that time. Therefore he is peculiarly qualified to make a success of the Blackburn seaplanes whether flying-boat or float type and to see that their operation is on a par with their design and construction.

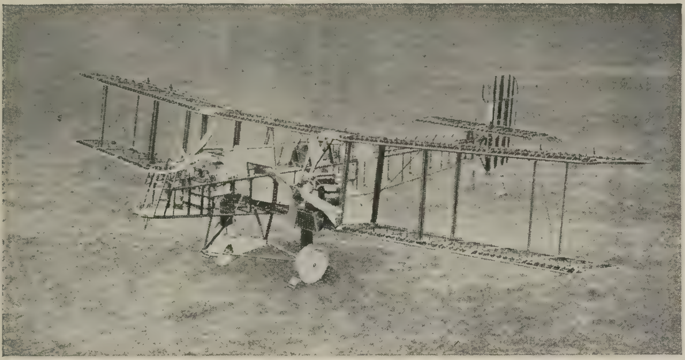
The photograph shows the rear of a new radial air-cooled engine built by the Walter Co. of Prague which has just been produced in Czecho-Slovakia. The engine is of normal five-cylinder type. Aluminium cylinders with steel liners, detachable cylinder heads, and valve springs made from flat strip instead of wire are among the main features of the design.

The crankshaft and master rod big end bearings are of the ball type, the auxiliary connecting-rods are articulated. All connecting-rods are of hollow circular section. Aluminium alloy pistons are used.

Only one magneto is shown in the photograph, but two are to be fitted to standard engines. The engine is rated at 60 h.p. at 1,400 r.p.m. and weighs 94 kg. (207 lbs.). The fuel consumption is 234 grammes (.52 lbs.) per h.p. hour and the oil consumption 11.3 grammes (.024 lbs.) per h.p. hour.

There appears to be considerable demand for aero-engines of about this size and type in Germany and some of the smaller Eastern countries where a good deal of progress has been made in the development of small single two and three-seater machines of a type intermediate between the light aeroplane and the normal commercial and military class of aeroplane. It is curious that in this country there is no engine of the 45-70 h.p. type of reasonably modern design.





An example of Boulton & Paul Metal Construction as carried out for the Air Ministry.

Metal Aircraft

FOR many years Boulton & Paul Ltd. have concentrated a large proportion of their unique technical resources on an investigation into the theory and practice of light metal construction.

As designers and manufacturers of aircraft they have applied the knowledge so gained to the production of metal aeroplanes.

The Boulton & Paul system of metal construction is the outcome of scientific research tempered by extensive manufacturing experience, resulting in lighter, more reliable and more durable aircraft.

Further particulars and conditions under which licences to manufacture under this system are granted will be sent to genuine enquirers on application to Dept. AE. :

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 7; Tuesday, 0; Wednesday, 0; Thursday, 10; Friday, 0; Saturday, 13; Sunday, 5.

London—Paris—Zurich:

Handley Page Transport, Ltd., machines 8, passengers 22, freight 3,832 lbs.

London—Ostend—Cologne:

Instone Air Line, Ltd., machines 7, passengers 6, freight 6,389 lbs.

London—Rotterdam—Hanover—Berlin:

Daimler Airway, machines 6, passengers 6.

Paris—London:

Air Union, machines 8, passengers 13, freight nil.

London—Rotterdam:

K.L.M., machines 8, passengers 11.

Special Machines: 0.

Total number of trips by British machines: 21, carrying 34 pas. Foreign machines: 14, carrying 24 passengers.

Comparative Figures:

For week ending Jan. 6:

Machines, 35; Passengers, 58; Crews, 57; Total personnel, 115.

Corresponding week last year:

Machines, 41; Passengers, 109; Crews, 80; Total personnel, 189.

Corresponding week, 1921:

Machines, 15; Passengers, 36; Crews, 23; Total personnel, 59.

Corresponding week, 1920:

Machines, 21; Passengers, 15; Crews, 25; Total personnel, 40.

Croydon Notes.

Tuesday, Wednesday and Thursday were blank days but on the remaining days of this week there was plenty of flying. Although the passenger traffic is still low Handley Page Transport Ltd. carried 3,832 lbs. of goods and the Instone Air Line carried 6,389 lbs. There was no rush of passengers either to or away from Paris where the Seine has been vainly trying to set a good example to the franc to the detriment of both the franc and Paris.

Croydon nowadays is experiencing considerable trouble from wireless amateurs who either accidentally or on purpose work on a wave length of 900 or on a sloppily-tuned wave length in the vicinity of 900. On Sunday morning Croydon was completely jammed by Hackney which was working on 842 metres, and after Hackney had been quelled an amateur started up a gramophone on 900 metres which completely jammed Croydon. It is high time that the G.P.O. took serious steps in the matter and kept the wave length in the vicinity of 900 metres clear. Luckily Sunday was a fine day, but if a similar trouble arose in bad weather and Croydon was jammed by careless or inefficient wireless senders it might be the cause of a serious crash. Therefore it is quite time that the authorities either Home or International took immediate action

The Aircraft Disposal Company are busy in their sheds on various types of machines for various types of people. Major Cooper's monoplane is having the shock-absorber material put on in a different way and should be flying again shortly.

An Important Order.

The Air Ministry has announced that the Air Navigation (Consolidation) Order, 1923, will come into operation as from Jan. 1, 1924, revoking the Air Navigation Orders, 1922 and 1923. Under the new Order it is stipulated that the journey log-book to be kept in respect of every British aircraft registered in Great Britain and Northern Ireland is to be one issued by the Secretary of State. Each book will be issued in respect of an individual aircraft, and the page containing the description of the aircraft will be completed by the Air Ministry. The aircraft and engine log books are no longer required to be carried in the aircraft Smoking is prohibited in any aircraft registered in Great Britain and Northern Ireland, wherever such aircraft may be, or in any other aircraft, when in or over Great Britain and Northern Ireland.

A History of British Aeronautics.

Mr. J. E. Hodgson, Honorary Librarian of the Royal Aeronautical Society, has compiled a work entitled The History of Aeronautics in Great Britain. This volume, which is to be published by Mr. Humphrey Mitford, Oxford University Press, Amen Corner, E.C.4, is intended to fill a gap hitherto existing in the literature of Aeronautics by providing in a compact form a sound historical record of the very important part which has been taken by British pioneers of aeronautics.

The work will consist of about 450 pages (Imperial 8vo.) and will cover the period from the legendary era until the beginning of the era of achievement—roughly the end of the last century. It is based on some five years' study of original or contemporary sources, and to the narrative there will be appended a Chronological Table, a selected and annotated Bibliography, a list of Papers in the Reports of the Aeronautical Society from 1866 to 1893, a note on Aeronautical Engravings, and a comprehensive index.

There are to be about 125 reproductions—some in colours —of rare engravings and drawings, autographs and books.

The edition will be limited to 1,000 copies, or less. The price to original subscribers has been provisionally fixed at £3 3s., but should a sufficient number of subscribers be forthcoming it is hoped either to reduce that price, or to improve the value of the work by increasing the number of illustrations. Should any of the edition remain unsold on publication a higher price will be charged to subsequent purchasers.

Full particulars, with specimen page, specimen illustrations, and table of contents can be obtained on application to the publisher.

An Adventure in Japan.

Major Chichester Smith, who has now returned to Japan, writing of his experiences says:—

> We were extremely lucky to get out of it alive, as my wife and I descended from the top story of the Grand Hotel, Yokohama, *with* the top story of the Grand Hotel, Yokohama, and were buried by the roof and walls of the Grand Hotel, Yokohama, until we had exactly one inch on each side of us and half an inch of space above us! In this position we were sifted about (the exact motion) until the Gods had finished their amusement, when to our surprise, the roof split open over our heads and showed us an excellent way out of all the trouble. *So* thoughtful of it. So we stepped out, unhurt, unscratched, but a bit bent about the nerve centres, and finding that Yokohama was flat, proceeded to get to the flattest part of it in case it did it again. Which it did—several times.
>
> We remained in our retreat until about nine p.m. when the fires having exhausted our part of the town, allowed us to think about getting aboard one of the ships in time for a gin sling (which I may tell you was badly needed). We got to the ship eventually (but not to the sling) and found that the most wonderful thing about the whole business was not the number of people *lost*, but the remarkably large number saved!
>
> How so many people got out of Yokohama alive is a miracle, for which there is no explanation Twelve hours of the most perfectly organised and obviously premeditated destruction which would have lifted up the heart of an arch-Hun. Warfare was a joke compared to it; night flying a tea party; there is no comparison with anything, no describing it, hardly can one think of it.
>
> And the next day licked it hollow. You have read of the epic work of the *Australia*, and heard how she, a 23,000 ton ship, turned herself round, dodged floating masses of oil (burning with a noise like a whirlwind to a height of a couple of hundred feet) and put her nose through the harbour entrance with four thousand refugees on board and an anchor and 75 fathoms of cable round one of her propellers. It was the most wonderful piece of seamanship imaginable, and all I fear is that the officers of that ship, and the C.P.R. Pilot (Capt. Kent) will not get the reward they deserve.
>
> One of those self-same lakes of fire nearly got me as I was pulling ashore that Sunday morning, and from that time (the worst two minutes I've had) until the Australia got out of harbour one had a very fair idea of what might happen And it damned nearly did. Sunday Sept. 2 was a very poor day
>
> You ask how it has affected aviation in Japan Not at all. Kasumigaura was not touched—although shaken—while the Air Station at Yokosuka was not badly damaged, being well out of the way.
>
> The Government are taking a very firm hold of things and there can be very few nations which could have tackled this business as well as the Japanese, and very few nations which would have treated the foreigners in their midst as considerately and as well as these people. The stories of foreigners being shot or maltreated are in practically every case downright lies and the effect of a disaster more horrible than you can conceive upon the nerves of certain overstrung romancers.

A Little More Knowledge.

It is perhaps a little difficult to decide whether "Peter Pan," whose letter entitled "A Little Knowledge" appeared last week, was merely indulging in a little gentle leg-pulling as one did oneself in the "Christmas Depressions" or whether he is slightly deficient mentally and so is seriously angered by one's apparent lack of reverence for his beloved wireless.

A British workman once said "There is no bad beer, but some beer is better than others." Similarly "Peter Pan" seems to think there is no bad wireless, and that anything heard on a radio set is good if it is well heard. The trouble with all these "radio fans" is that they care much less what they hear than how they hear it And judging by the appearance of the window-gazers outside and the purchasers inside the shops which purvey wireless gadgets a perfectly accurate rendering in pure Cockney of "The Lost Chord" would please them better than hearing a 35 guinea H.M.V. gramophone reproducing the "Preislied" from the "Meistersinger" sung by Mr. Walter Hyde.

Possibly "Peter Pan" is a person of leisure who can afford to devote hours and pounds per day to perfecting his wireless apparatus, but the average well-to-do business man buys a wireless set as he buys a gramophone and expects it to work. Till such fool-proof sets are on the market one prefers (being a fool in these matters because there are better ways of spending time than in perfecting wireless sets for the benefit of makers who sell imperfect articles) to keep a gramophone or a pianola

As to the repertoire of the broadcasting stations, one does not imagine that the variety offered in any one day is as great as is the choice of records offered by the Gramophone Co. or the Æolian Hall. And certainly one has never heard any regular broadcasting band which as a band equals those recorded on gramophone records. One excludes of course temporary broadcasts from Covent Garden Opera House or the Savoy Ball Room.

Judging by the stuff that is generally broadcast the whole game appears to be in the hands of people of about the mental capacity and outlook of an American movie impresario assisted by a sub-editor or two from our more popular daily news-sheets. In such matters one does not pretend to be a highbrow, one merely lays claim to a fairly educated taste in music and literature.

Wireless is, of course, a good thing, and when proper ground observation stations are established on our air lines it will be the making of Civil Aviation. But considered as a form of social entertainment it is one degree worse than bridge, and a trifle less irritating than musical chairs.—C. G. G.

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PERSONAL NOTICES.

Deaths.

ALDRIDGE.—On Jan 5, at Halton, Bucks, of acute pneumonia, Mary Caroline, wife of Sq. Ldr. Aldridge, R.A.F. (M.S.).

CONRAN.—On Jan. 6, at a Nursing Home in London, following an operation, Sq. Ldr. Eric Lewis Conran, M.C., R A.F., late 21st Lancers, beloved and only son of Mr. and Mrs. Henry L. Conran, aged 36 years.

[Eric Conran was an officer of the Royal Flying Corps before the War 1914-18, and was a notably good pilot of Blériot monoplanes. He went to France with the historic "First Four Squadrons" and did good flying service. He suffered much in health in the later stages of the war and never quite reached the rank to which his earlier work entitled him. In him the King loses a loyal and keen officer, and the older members of the R F.C. will mourn the loss of a good friend.—C. G. G.]

BARNES.—On Dec. 14, killed at Mosul, Iraq, the result of an aeroplane accident, Plt. Off. John Owen Barnes, aged 21 years

HOWELL.—On Dec. 19, John Gwynne Howell, M.C., late Major, R.A.F., of 9, The Paragon, Blackheath, S.E.3, husband of Jessie E. Howell (*née* Preston) and only son of Mr. and Mrs. Howell, of Castlemead, Manorbier, Pembrokeshire, aged 32.

McALERY.—On Jan. 4, at Hinaidi, Iraq, while flying, Flt. Lt. John Macredy McAlery, No. 1 Squadron, R.A.F., only son of the late Rev. J McAlery and Mrs. J. O. Campbell, and the beloved husband of Cecily Mary McAlery.

[John McAlery did me the honour of counting me among his friends. His death is a severe blow to all who knew him. There follows hereafter an appreciation of him written by one who knew him better than I did.—C. G. G.]

John Macredy McAlery was born in Belfast in 1892 and was the son of the late the Rev. John McAlery It was his original intention to adopt engineering as a profession but the outbreak of the war altered all plans In the months immediately preceding the war he was an enthusiastic and efficient member of the Ulster Volunteers, then preparing, under Sir Edward Carson's direction, for the defence of Ulster against disunion. In August 1914, John McAlery joined the Royal Irish Rifles and with a battalion of that regiment served in France. Later he transferred to the R.F.C. and speedily showed ability as a pilot and as an officer. He was demobilised in 1919 as a Captain and Flight Commander and in 1921 rejoined the Royal Air Force with a Short Service Commission. His intention was to be placed in the regular establishment and to devote the rest of his life to the profession he loved so well. He lost no opportunity of increasing his knowledge of the art of war and of the economy of armed forces.

In Jan. 1922 he married Cecilia Mary, daughter of Mr. and Mrs. Scott-Holmes of Norwich.

Shy and reserved among strangers and in general company it was only to those intimate with him that he revealed the strength of his character and the inherent generosity of mind which set him above the majority. For his friends and for those in trouble, whether they were friends or enemies, he would make every effort to ease the passage of the days. His lips never spoke evil of his fellows and he had toleration for all things save meanness of spirit. Subterfuge and intrigue were alien to his nature and that he was often imposed upon by many who knew his grace of character is only disgraceful to those who profited by such impositions. Loyalty was the guiding spirit of his life, whether to the King, to his Service, to his friends or to those principles which dominate the lives of upright men.

He has gone to join his peers but he leaves here unforgettable memories of a great soul and a chivalrous gentleman.—W. E. DE B. W.

Engagements.

PUMPHREY—PUMPHREY.—A marriage has been arranged, and will take place, between Mr Frederic Alan Pumphrey, R.A.F., third son of Mr. and Mrs Frederic Pumphrey, of Vancouver, B.C., and Muriel, youngest daughter of the late T. E. Pumphrey, J.P., and Mrs. Pumphrey, of Mayfield, Sunderland.

THORNTON—BARTLETT.—The engagement is announced between Capt. T. G. Thornton, M.C., D.F.C., of 9D, Oxford and Cambridge Mansions, N.W.1, and Catharine Eleanor Mary, second daughter of Mr. and Mrs. J. H. Bartlett, of 27, Redcliffe Gardens, S.W.10.

Marriages.

GLAISHER—CLELAND.—On Dec. 27, at the Chapel Royal, Savoy, Flg. Off. John Malcolm Glaisher, D.F.C., R.A.F., son of the late Henry Glaisher and Mrs. Glaisher, of Blackheath, to Nora Gladys Edith Leah Cleland, daughter of the late Hubert Davies, of Johannesburg.

YOUNG—MATHESON.—On Dec. 29, at Hendon, Sq. Ldr. Peter Hutchison Young, R.A.F., Medical Service, to Hylda Matheson, Queen's Lodge, Edgware, Middlesex

Births.

COURTNEY.—On Jan. 3, at 4, Bedford Park, Croydon, to Constance, wife of Frank T. Courtney—a daughter.

Another Royal Appointment.

Past and present R.A.F. people who had so much to do with Crossley cars during the War 1914-18 will be interested to learn that Crossley Motors Ltd. have been appointed Motor Car Manufacturers to His Majesty the King—by notice in the *London Gazette* of Jan. 1. This appointment is doubtless the result of the excellent work done by Crossley cars during the Prince of Wales' World Tour, which earned the firm a similar appointment to His Royal Highness.

Crossley Motors Ltd. are closely allied to A. V. Roe and Co. Ltd. so one hopes that in the course of time we shall hear of an Avro limousine of large size being ordered for the use of the Royal Family. In which case the Avro Company would be duly appointed purveyors of aircraft to a Royal personage.

Aeroplane Pictures.

Week by week there will appear in this paper wash drawings by Leonard Bridgman of various types of aircraft, representing new machines produced at home and abroad, British and foreign Service aircraft, and so forth. It is hoped that this regular feature will be appreciated not only by those kind people who have constantly urged THE AEROPLANE's artist to justify his existence but by others as well. The originals, in black and white, are all of a standard size, 14 in. by 10 in., and these may be purchased by arrangement.

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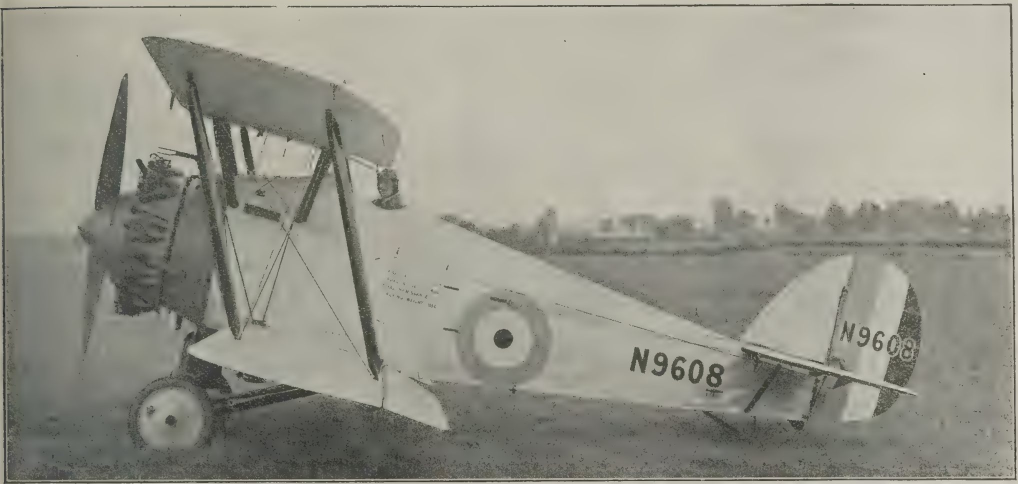

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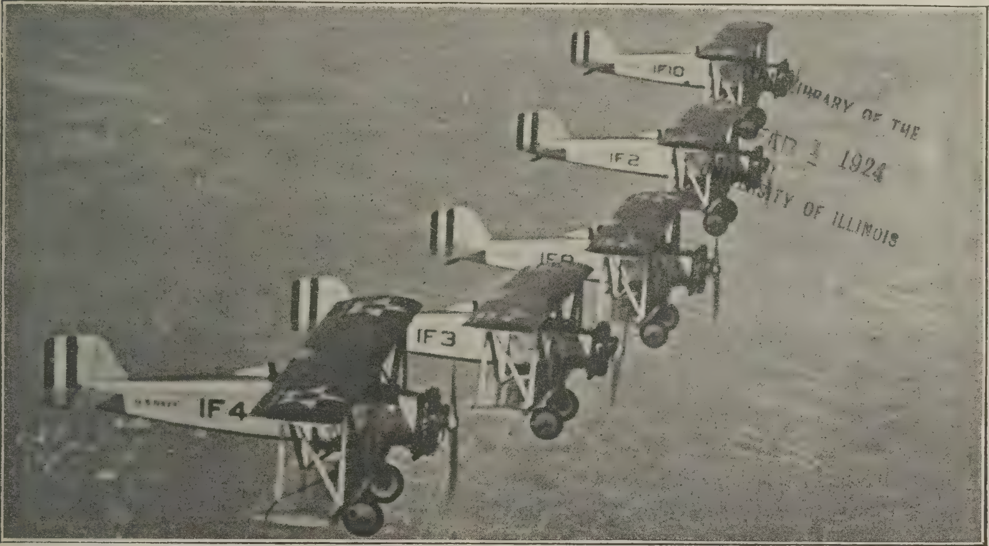

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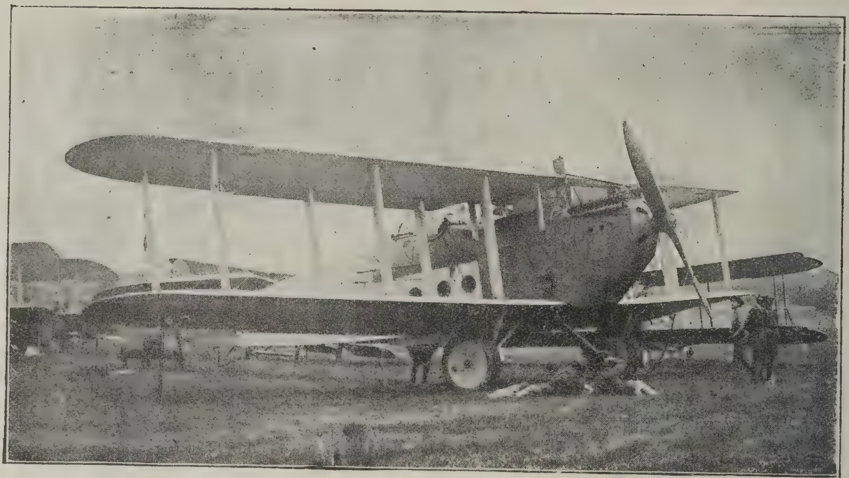

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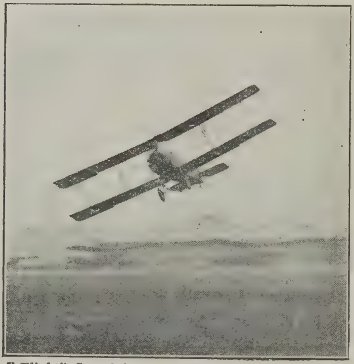

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ON RACING SPEEDS.

When considering the conditions of the flying competitions of 1924 the Racing Committee of the Royal Aero Club will do well to pay special attention to the rules laid down for the Aerial Derby and other speed competitions. Up to the present we have been so fortunate as not to have anybody killed in an Aerial Derby but that has been due much more to luck than good judgment: or perhaps one should say it has been due to the reliability of British engines rather than to anything else. Under the present unlimited conditions we produce perfectly useless aeroplanes whose only virtue is their speed, and that speed is obtained by caring nothing for the pace at which they land. The flying speed of the machines is limited chiefly by the chances the pilots will take of killing themselves in landing.

Those who saw the Gloster and the Sopwith-Hawker land at the finish of the last Aerial Derby can form some idea of what would have happened if either of those machines had suffered from engine failure over a difficult bit of country. Some weeks later Flight Lieut. Longton was in fact forced by engine failure to land out in the country near Brooklands, and his great skill helped by very good luck enabled him to crash the machine without killing himself. But there are many stretches round the Aerial Derby course where even the best of luck and skill could hardly prevent a fatal accident.

The Americans whose racing machines are considerably faster than ours have recognised the danger of unlimited landing speeds and for the Pulitzer Trophy Race last year imposed as a condition that all competing machines must be capable of landing at a speed not exceeding 75 miles an hour. It is true that the machines were not required to do a timed landing at that speed, the Organising Committee merely accepted the word of aerodynamic experts that machines of the weight and area and wing-curve given were capable of landing at that speed or less. Knowing the habits of aeroplanes one doubts whether any of these machines could in fact have landed at such a speed. In any case 75 m.p.h. is very much too high a speed to be safe in a cross-country landing.

Therefore one suggests to the Racing Committee of the Royal Aero Club that one of its very first actions this year should be to announce definitely that no machine will be allowed to compete in the Aerial Derby or in any other speed race if its landing speed is above 50 m.p.h.

Such a regulation will have definitely two effects:—

(A) It will reduce materially the danger of fatal accidents in the speed races themselves, and

(B) It will go far towards producing genuine progress in aeroplane design, for it will set our aeroplane designers the problem of designing a machine with a low landing speed and the greatest possible flying speed.

This will tends towards producing a really useful speed machine which can with slight alterations be made into a high speed war machine of the type called by us a scout and by the Americans a pursuit airplane. A machine which can fly at anything between 200 and 250 miles an hour and yet can be induced to land at 50 miles an hour becomes at once a useful article of air war as well as being a comparatively safe sporting vehicle.—C. G. G.

ON A NOTABLE SUCCESS.

Under its proper heading "Company News" there will be found elsewhere in this paper the statement that the Aircraft Disposal Co. Ltd. has satisfied, or in other words paid off, £900,000 worth of debenture shares the balance of £1,200,000 worth originally issued.

This bald official statement conjures up visions of an aircraft company in this country capable of making approximately a million pounds profit in the course of a little over a year. Inquiries in the right quarter have produced the information that although the A.D.C. has undoubtedly done very well since its formation for the purpose of getting rid of surplus Government aeroplanes and aircraft material it is not yet quite in the happy position of making profits in millions.

The facts apparently are that these debenture shares were issued with only one-third of their value paid by the holders and that they have now all been paid off, the sum necessary to do so being just one-third of the amount which appeared in print. Even so a matter of £300,000 is by no means to be despised and the Disposal Company is to be congratulated very sincerely on having done so well. But the chief reason why the Disposal Company deserves congratulations is that it has done such excellent work for the British Aircraft Industry as a whole.

The original stock of the A.D.C. included aircraft of every known make and design produced throughout the War. As soon as the War was over the French and the Italians began sending official missions all over the World to push their aircraft products. These missions were financed by their Governments and the personnel were officers in uniform. Naturally the British Government did nothing of that sort and the pushing of British aircraft abroad was left to individual enterprise. Individual firms sent their individual representatives sometimes with and generally without machines to fly. The natural result was that the majority of these missions failed to do any business at all and spent a vast amount of money.

If the whole trade had combined to send a co-operative mission to each of these countries quite possibly good business might have followed. But co-operation is never the strong point of the Anglo-Saxon.

The A.D.C. began its work in foreign countries after most of the individual representatives had failed and its results have been excellent. One believes it is correct to say that the Disposal Company has sold British aircraft in every country in the World which has any aspiration to possess aircraft.

The general management of the firm, with Lieut.-Col. Barrett Lennard and Lieut.-Col. M. O. Darby acting in conjunction as Managing Directors and Major J. Stewart as the Chief of Staff, has been excellently run and the Works at Waddon under Major J. R. Grant and Mr. Walker have turned out the machines in a way which has given very great satisfaction to all nations which have purchased them.

So far as the Continent of Europe is concerned one may safely ascribe a very large share of the A.D.C.'s success to M. Richard, who has a perfect genius for getting in touch with the people who really matter in every country and doing business with them on thoroughly sound straightforward business lines. Apart from being a business man of the first rank M. Richard is known to everybody who has come in touch with him as one of the kindest-hearted of men and he must spend at least as much time doing good turns to people as he does in doing good business for his firm.

Altogether the turnover of the Company has amounted to several millions of pounds and the Government, which receives 70 per cent. of the net revenue, has already received something like three times as much money as it ever expected to get.

But perhaps the most valuable work of all done by the A.D.C. is that it has introduced to foreign nations, in spite of competition from countries whose low rate of exchange enables them to quote cut-throat prices, British aircraft of all makes at a price which has made it possible for small and poor countries to buy them. The result is that all these nations are now satisfied that British aircraft even of the wartime types are at least the equal of any other aircraft in the World, and consequently nearly all these countries are now buying or negotiating for the very latest types of aeroplanes produced by our leading manufacturers.—C. G. G.

A LIGHT AEROPLANE CLUB.

A number of enthusiasts have under consideration the formation of a light aeroplane and glider club near London for persons (flying and non-flying) interested in the movement. Will any readers who are interested kindly send their names and addresses to Mr. R. Preston, c/o 70, The Drive, Fulham Road, S.W.6?.

As soon as sufficient names have been received, it may be possible to hold a meeting of those interested to discuss proposals and for the formation of the suggested club.

SINGAPORE AND THE OIL SUPPLY.—(Part I.)

By C. G. GREY.

The other day a young man of good education and exceedingly intent on joining the Royal Air Force went up for examination by a Selection Committee at the Air Ministry in the hopes of being granted a Short Service Commission. He was turned down by the Committee, doubtless for adequate reasons. Perhaps they did not like his face. Perhaps they did not like his manner, which through nervousness is apt to appear on occasion too self-assured. But he himself is under the impression that he was rejected because the Committee imagined him to be so lacking in general knowledge as to be unfit to associate with R.A.F. officers.

He was asked what newspapers he read. He replied that he read none, because having had by family connection considerable experience of the printed word he did not believe anything he read in a newspaper till the statement had been confirmed by history. He was also asked where Singapore was and what he knew about it. He replied that it was somewhere near India and that there was a mutiny of native troops there some years ago. Which is perfectly true, though not perhaps as exact as the Committee could have desired.

The Committee may have been quite right in turning him down on other grounds but his answers to those two questions ought rather to have counted in his favour. It is however possible that the Committee considered that a youth holding such exact views on publicity and such inexact views on geography showed too much originality of mind and might not develop into the standardised mass-product type of officer which is most desirable in a large Service where smooth running is desirable and in which any form of eccentricity is as undesirable as it would be in a gear box. All the cogs in a wheel must be alike. Eccentricity in revolution leads to Bolshevism, intellectual or mechanical.

Concerning Newspapers.

On the matter of newspaper reading one is inclined to sympathise with the rejected candidate. A course of ill-directed newspaper reading is as deleterious to the intellect as is excessive cigarette smoking or cock-tail drinking. In fact most newspapers are a species of verbal cock-tail, titillating but without substance. If one waits till the crudeness of snippet news has evaporated and matured into the sound wine of history one may perchance arrive at fact. But there is the objection that one has long to wait, something on the principle of the old farmer who replied to an enthusiastic advocate of forestry :—" Trees is a damned slow crop."

Nevertheless some newspapers have their advantages. Pip, Squeak and Wilfred on week-days and Felix the Cat on Sundays are pure joys. One knows many intellectual and well-informed men who buy their papers solely for the news of the doings of those world-famous characters, and reject all else as of doubtful value or veracity.

As one who has had for his sins to glance through many dozens of columns pretending to deal with the wrecked airship *Dixmude* one has now less faith than ever in the intelligence and sense of newspaper sub-editors or in the reliability of news-services and news-agencies. And one therefore regrets all the more that Air Force Selection Committees should set store by the reading of newspapers.

This is the more so because on occasion when breakfasting in R.A.F. Messes one has observed that the coffee-cups of the young officers more often support the cheaper and yellower type of newspaper with the easily read headlines than they do the slightly more expensive and more serious publications. The sight of those potentially intelligent young men absorbing so much mental flatulence with their first meal of the day somehow always recalls the *Punch* picture of the small girl going to the street news-vendor and saying :—" Please father says will you let 'im 'ave the poster instead of the paper, 'cos there's more news in it?"

Geography for the Young.

Consequently, The Aeroplane, priding itself after the manner of the Pharisees in the fact that it is not as others are, may be doing good work by explaining something about Singapore for the benefit of young officers who through reading newspapers are probably just as ignorant as to the place and importance of that delectable city as was the rejected candidate aforesaid, and merely read The Aeroplane because on occasion it is funny without (one hopes) being vulgar.

If the reader will take the trouble to look at a large map of Asia and will find India therein, he will find on the right-hand side of India a large expanse of water called the Bay of Bengal. And at the right hand bottom corner of the Bay of Bengal he will find Singapore at the extreme point of a strip of land called the Malay Peninsula. Below it, and extending to the right (or perhaps one should say to starboard, seeing that this is an affair largely affecting the Fleet Air Arm), he will find the Malay Archipelago—the word archipelago has come to mean a collection of islands, one may add for those unversed in the Humanities. And the Malay Archipelago in its larger sense includes the Dutch East Indies.

Still further to starboard and nearer the top will be found the Philippine Islands, which belong to the United States. Quite near the top of the Philippines is Formosa, which is the lowest island of the Japanese Empire. And to port of Formosa close to the continent of Asia is found Hong Kong, which is the most advanced Naval base of the British Empire in the Far East. Far away to starboard of Japan, about half-way to America, and right in the middle of nowhere, there can be found if the map be sufficiently comprehensive a tiny speck marked Guam. That is the furthest West base of the United States Navy.

Right away down below the Dutch East Indies but separated from the Dutch Islands by only 100 miles or so of sea, is Australia, which is a somewhat important component part of the British Empire in spite of its small population. And here it is well to recall the fact that in flying from England to Australia the brothers Ross and Keith Smith after crossing India flew down the Malay Peninsula to Singapore and thence hopped from island to island of the Dutch East Indies to Port Darwin, the nearest point in Australia to the Malay Islands. Singapore was the jumping-off place from the mainland to the islands.

If that simple lesson in geography be learned with the aid of a map the young officer may be the better able to understand the strategic importance of Singapore, bearing in mind that strategy is that which is concerned with the area of war and tactics with the field of battle. Even those whose knowledge is greater than that of the young officer may do well to refresh their memories by looking at the map of Asia and regarding Singapore as the focal point and not Hong Kong as has hitherto been somewhat the custom among students of World-war strategy.

The Singapore Base.

Early in 1923 it became known that it was the intention of the Admiralty to build an enormous Fleet Base at Singapore, a place which has a magnificent harbour and has long been known as the Gateway to the East. It was announced that docks were to be built there capable of accommodating and repairing the largest battle-ships. The Federated Malay States, whence we derive most of our rubber and a good deal of our tea, offered to present the land for the docks and an aerodrome. And Australia offered to bear a proportion of the cost of building the base. These two offers prove that those people of the British Empire who are most concerned to assure peace in that part of the World and who know most about Far-Eastern World-politics are ready to stand the cost of preparing for war.

When the announcement of this new Singapore policy became known the usual political controversy was aroused. Labour politicians and pacifists cried aloud that we were inciting to war or were preparing for war—either being equally wrong in the estimation of a certain type of mind in spite of the lesson of our unpreparedness in 1914. Others declaimed against the scheme as a menace or an insult to our gallant ally Japan, apparently imagining or pretending to believe in spite of the lessons of all history that alliances are everlasting and that treaties are unbreakable, and neglecting to state—either through ignorance or wilfulness—that the Anglo-Japanese Treaty has expired by the natural lapse of time. And others more intelligent or more honest, like the Lord Grey of Fallodon (who was quoted at the time in this publication) stated openly that the proposed base was to be built not as a menace to Japan but as a safeguard against possible aggression by Japan in case of a real Race War of the White Race against the Yellow in which the United States would be allied with Great Britain.

Causes of War.

No matter what may be the immediate cause of the outbreak of such a war there are certain facts always existing in the Far East and the Pacific Ocean which tend towards war. The assassination of an Austrian Archduke in Bosnia by a Servian was the immediate act which caused the War 1914, but the underlying fact was the racial antagonism between the Muscovite Russians and the Germans. Because the Russians were building strategic railways all along the German frontier the war had to be started before those railways were ready to work. The assassination of the Archduke offered the excuse. The war was begun before Germany was properly ready, and that was one of the chief reasons why Germany was defeated.

Similarly there is the natural racial antagonism between the yellow Japanese and the white Americans in the Philippines, the Dutch and English in the Malay Archipelago, and

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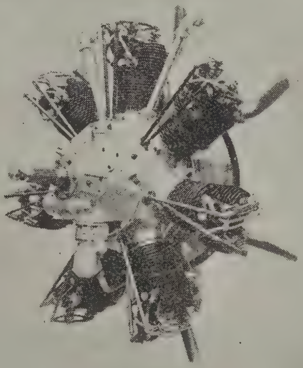

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the English in Australia and the Malay Peninsula. Also, Japan has a population fifty per cent greater than that of the British Isles (the earthquake of 1923 had no appreciable effect on it) and continually needs an outlet for surplus population. China is already over-crowded. Korea is not alluring. Siberia is cold and uncomfortable. There remain then Australia, the Philippines and the Malay Islands, all warm, fertile and comfortable. And all are barred rigorously by their white owners against Japanese immigrants as permanent settlers. Japanese may in some cases live in those countries as servant or labourers, but they may not own land and become part of the regular population. And somewhat naturally the Japanese, an aggressive and acquisitive people, are annoyed.

There you have a perfectly sound basic reason for a perfectly good war in the East Indies as soon as a decent excuse can be found for it and as soon as the Japanese Fleet and Flying Services are ready for war.

Now the Japanese Fleet has been but little affected by the earthquake of 1923 except that all its oil-storage tanks around the Naval Base at Yokohama have been destroyed and the oil has been burnt. And the Japanese Army and Navy air forces have not been affected at all, all their aerodromes and depots being far outside the earthquake area. But as yet neither the Fleet nor the Flying Services are big enough for a war of aggression. Also the Fleet is limited in size by the Washington Treaty of 1922, though that Treaty will have little effect when Japan resolves on war.

If Japan started building warships in quantities in defiance of the treaty the other nations which signed the document might combine to stop her by force, though perhaps through mutual jealousy they might not. On the other hand Japan might prepare quietly vast quantities of materials with which to build warships on the plea that the steel and other material was for the rebuilding of the earthquaked area and then rush them through the dockyards at high speed while staving off by diplomatic guile the threatened attack of the other nations. And when diplomacy could do no more any attack from the sea on the ship-building yards could be repelled by an adequate air force.

Which is why it is so desirable to keep a close watch on aerial developments in Japan. Already the Japanese Government have bought samples of almost every best British, French, German, Italian and American aeroplane and engine. And it is a noteworthy fact that Japan is the biggest buyer among all nations of technical books on the design, construction and performance of aircraft. There is no need for argument about Japan's intention to have the biggest and best-equipped air force in the World.

Aircraft of Japanese design are as yet a joke. But aircraft built in Japan to European designs are very good indeed. Mr. Hector Bywater in his comprehensive book *Sea Power in the Pacific* has shown how the Japanese, having begun ridiculously on designs of their own, can now build anything in the way of Naval materiel from a battleship to a torpedo each of which is a definitely improved version of a European model. And if they can do this with ships they can assuredly do it with aeroplanes and engines.

INVASION BY AIRCRAFT.

Given the aircraft it is likely that the Japanese can do without big battleships for their sea campaign against the Philippines and the Dutch East Indies. Where the big battleship scores is that in foul weather when flying is impossible it can pound an aircraft-carrier to pieces—if it can catch it unawares or if the carrier is too slow to get away. But given fair flying weather it ought to be possible for the aircraft flying off a carrier to sink or put out of action any battleship long before battleship and carrier could see one another, let alone come within shooting distance.

Now, in such a campaign as the capture of the Philippines and the Dutch East Indies the Japanese have great advantages, for the southernmost Japanese island, Formosa, is well within flying distance of the Philippines so that much of the attack on the property of the United States can be delivered from shore bases. If the Japanese have the acumen to develop big long-range seaworthy flying boats—with which type of craft the Japanese Navy has already done notably good work—the whole of the seas between Japan and the Philippines can be made safe against U.S. submarines and warships so that Japanese carriers equipped with deck-flying bombers and fighters can approach the coast with safety, clear away defensive aircraft and leave the Philippine cities unprotected against bomb attacks. And it may be assumed that ports like Manilla would not stand up to much bombing before surrendering to Japanese transports carrying troops.

The U.S. Army has a very useful aircraft base in the Philippines and no doubt there would be a great deal of air fighting before the Japanese cleared the U.S. aeroplanes out of the air. But the U.S. air service in the Philippines is a long way from its sources of supply in America and the Japanese would be practically flying from home stations, so unless the Japanese personnel were very bad (which they are not) and the Americans preternaturally good (and they are very good) victory would have to go in the end to the Japanese.

The Americans could not draw their supplies from the East across the Pacific for such supplies would have to run the gauntlet of the whole Japanese fleet and such aircraft as were not employed directly in the capture of the Philippines. Even if Guam were big enough to act as base for a great battle fleet it is still too far from the Philippines to be useful to their defence. It is in fact only a safeguard against attack on America itself. Therefore America's only chance would be to send supplies and reinforcements across the Atlantic, along the Mediterranean, down the Red Sea, across the Indian Ocean to Singapore and thence to Manilla.

By the time such reinforcements could arrive the Japanese would almost certainly have captured the Philippines and so the ultimate destination of men and material would have to be our base at Singapore, unless the Dutch East Indies were still holding out, in which case the American forces would almost certainly be sent at once to help the Dutch. And it would be over, above, around and because of the Dutch East Indies and their oil fields that the first great battles of the war would be fought.

(*To be continued.*)

The Modernisation of the Argentine Army.

The Department of Overseas Trade, referring to the law recently passed in the Argentine authorising an expenditure of $100,000,000 gold, states that the Commercial Secretary at Buenos Aires has reported to the Department of Overseas Trade that the composition of the Purchasing Commission is now announced in the local press.

There is to be (1) a Permanent Technical Commission with headquarters at Buenos Aires and (2) A Foreign Purchases Commission which is to visit Europe. Purchases to be effected comprise armaments and munitions, aviation material, army medical equipment, plant for munition factories, etc. The Foreign Purchases Commission will make purchases of material for instruction for the Army, reporting in detail on the characteristics of the most modern material in each country.

The Minister for War stated on December 1 that no purchases had yet been made from the sum authorised, and that no purchases could be made without the proper control of the Ministry of War and the Central Committee of Armaments. Contracts signed by the purchasing sub-committees in Europe will be *ad referendum*, subject to the consideration and subsequent approval of the Ministry and Central Committee.

The full purchasing commissions will leave for Europe during February or March of this year, but two members sailed for Europe on Dec. 12 in advance of their colleagues in order to purchase rifles, machine guns, bomb-throwers, and aviation material. They will begin a preliminary inquiry in connection with further supplies. These purchases will be made from funds authorised by the Budget in force. The first destination of these officers is Paris.

It seems that the S.B.A.C. should bestir itself to get in touch with these advance agents of the Argentine Commission lest our Continental competitors secure all the business. It is significant that their first objective should be Paris.

A Flying Fortnight.

Some few words were said recently in this paper on the subject of exhibiting aircraft at the British Empire Exhibition at Wembley. So far as can be gathered nothing very definite has yet been decided, but it seems that the Society of British Aircraft Constructors as such do not intend to exhibit though some few individual firms may do so. There is however a scheme on foot which seems likely to be much more useful to British aviation than any standing exhibit of aircraft material could be. That is to hold an aviation fortnight somewhere in the middle of the Summer, the idea being to draw to the aerodrome during those days all the people from abroad who are in England for the Exhibition.

One would not like to lay down any definite opinion as to what aerodrome should be allocated for the purpose, but evidently it should be one somewhere in the vicinity of Wembley. People will hardly want to go all the way to Croydon from the Exhibition. There are in fact five aerodromes all within easy reach of Wembley, namely, Stag Lane, Hendon, Cricklewood, Kingsbury and Acton, any one of which would be more or less suitable and each of which has some special quality which makes it suitable.

The general idea is to concentrate in that fortnight as many as possible of the leading sporting events of the year. Thus the King's Cup Race could be flown on two days in the middle of the week, with the R.A.F. Pageant on the Saturday. And there could be a light aeroplane competition in the middle of the following week with the Aerial Derby on the Saturday. On the intervening days there would be general

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THE AIR TAXI.—The De Havilland 50 with 240 h.p. Siddeley Puma engine as seen by Mr. Leonard Bridgman. The machine, already well known to readers of The Aeroplane, carries 4 passengers in an enclosed cabin. It was designed expressly for taxi work with the De Havilland Hire service and already has a number of long journeys to its credit.

flying and possibly informal racing and plenty of opportunities would be given to visitors to fly.

Such an arrangement would concentrate the interest of everybody concerned with aviation at the aerodrome during that fortnight and therefore it would be very well worth the while of every manufacturing firm to send specimens of its latest types of machine to fly and exhibit their qualities. The scheme on the whole is excellent and it is to be hoped that it will receive the full support of the Aircraft Industry, for a fortnight of intensive flying of this sort would certainly attract the attention of visitors to this country from foreign nations and the Overseas Dominions.

Round the World.

On Apr. 1, Sq. Ldr. Archibald S. C. Maclaren, O.B.E., M.C., D.F.C., A.F.C., R.A.F., will start from Croydon on a Vickers Viking with a Napier Lion engine on an attempt to fly round the world. Sq. Ldr. Maclaren will act as the navigator and Flg. Off. John L. Plenderleith, R.A.F., will be the pilot. Sergeant Andrews, R.A.F. will be engineer-in-charge.

The machine has been supplied by Vickers Ltd. and the engine and two spare engines (one of which will be in reserve at Tokyo and the other at Toronto) by D. Napier and Son Ltd. Shell-Mex Ltd. are supplying the petrol and oil and are looking after the placing of fuelling depots on the route.

Mr. S. P. Cockerell accompanied by Mr. Plenderleith flew the machine recently from Brooklands to the R.A.F. station at Isle of Grain and from now until the time to start the crew will gain experience with the machine.

Mr. Plenderleith has done much flying with Sq. Ldr. Maclaren in the East and according to the Air Force List both officers are stationed at the Isle of Grain. Sergeant Andrews has been for three months at the Vickers works and three months at the works of D. Napier and Son Ltd. gaining inside knowledge of machine and engine.

The flight is expected to take three months and the crew will have leave from the R.A.F. and be placed on half pay. The route followed will be that planned by the late Sir Ross Smith. The crossing of the Atlantic will depend much on circumstances. Under ordinary conditions it will be made via the Azores and Lisbon, but if there is any danger of competition from any of the other participants a direct flight from Newfoundland to Croydon with a re-fuelling stop in Ireland may be attempted.

The Viking has been designed for the flight by Mr. Rex Pierson and is very similar to the Ross Smith machine.

A Double Trans-Continental Flight.

With a view to determining the feasibility of using aeroplanes of large size and capacity on the Air Mail route across the American continent, the U.S. Army detailed a standard Army Martin bomber (2-400 h.p. Liberty engines) to make a round trans-continental trip from Norfolk on the Atlantic coast to San Francisco and back.

The Martin bomber piloted by Lieuts. J. F. Whitley and H. D. Smith with two mechanics left Norfolk on Sept. 15 and flew via Dayton, O.; St. Louis (for the Pulitzer Race), and Fort Leavenworth, Kan.: after which they followed the Air Mail route, North Platte, Neb.; Cheyenne, Wyo.; Elko, Nev.; Reno, Nev.; Mather Field, Sacramenta, Cal.; to Crissy Field, San Francisco.

The return trip was made via Yuma and Tucson, Ariz.; El Paso, Sanderson, San Antonio, and Dallas, Tex.; Muskogee, Okla., Kansas City, Mo.; St. Louis, Dayton and Washington.

The pilots experienced considerable difficulty in flying over the high territory embracing the Rocky Mountains, owing to the low ceiling of the Martin bomber. It reached its maximum altitude at 9,500 ft. and barely skimmed the ground above Lyman, Wyo., where owing to the thin air the machine lost 1,500 ft. and flew at 50 ft. above the ground.

Russian Purchases in France.

It is understood that the Russian Aeronautical Mission sent to France to buy French aircraft materiel has purchased during the last month 54 Hanriot and four Morane-Saulnier aeroplanes, presumably training machines. They have also bought engines, spare parts and aircraft equipment to the amount of 17 million gold roubles.

It is also reported that another order for 100 various types of military machines and 50 commercial aeroplanes is to be entrusted to French firms.

The late Lawrence Sperry.

An inquest was held on Monday, Jan. 14, on the body of Lawrence Sperry which was found in the sea off Rye last week. Evidence of identification was given by Mr. G. H. Jackson of the Sperry Gyroscope Co. Nothing was discovered to explain his death and the jury gave a verdict of Found Drowned.

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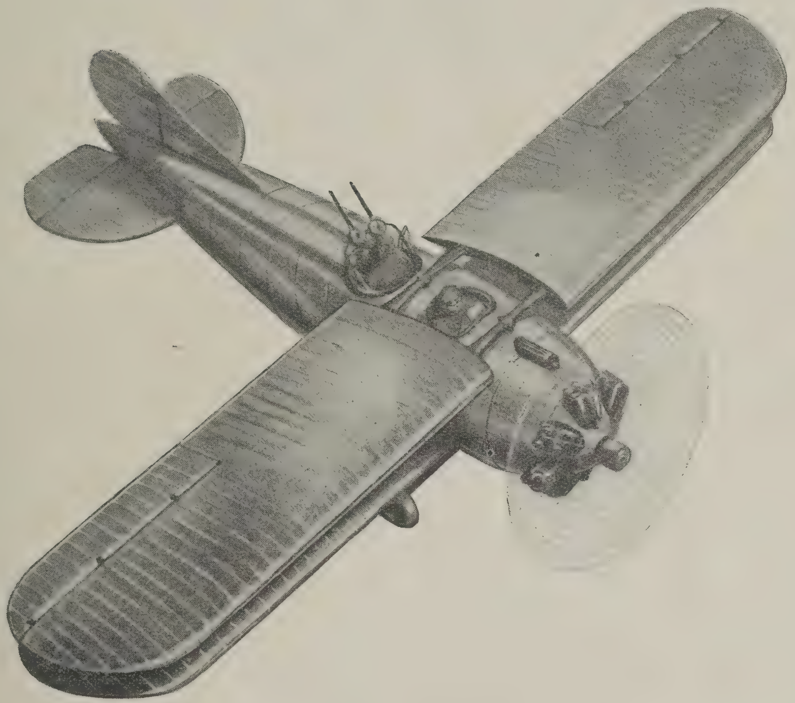

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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Appointments.

General Duties Branch.—Wing Cmdrs A. H. E Wynn, O.B.E., to No. 7 Grp. H.Q., Andover, for Air Staff duties, 14/1; J. T. Babington, D.S.O., to No. 3 Grp. H.Q., Spittlegate, for Air Staff duties, 14/1.

Sq. Ldrs. H. V. Champion de Crespigny, M.C., D.F.C., and A. W. F. Glenny, M.C., D.F.C., to R.A.F. Depot on transfer to Home Estab., 17/12; P. C. Sherren, M.C., to Aeroplane Exper. Estab., Martlesham Heath, 21/1.

Flt. Lts. P. Huskinson, M.C., to No. 5 Wing H.Q., Biggin Hill, 11/1; E J. Cooper, D.S.C., to Marine and Arm. Exper. Estab., Isle of Grain, 11/1; A. L. Fiddament, D.F.C., and K. A. Lister-Kaye, to R.A.F. Depot on transfer to Home Estab., 17/12; H. A. Smith, M.C., to No. 39 Sqdn., Spittlegate, 14/1; J. A. Boret, M.C., D.F.C., to No. 32 Sqdn., Kenley, instead of to No. 100 Sqdn., 14/1; V. H Tait, to Air Ministry, 16/1; F. Wright, to Arm. and Gunnery School, Eastchurch, 14/1.

Flg. Off J. Messer-Bennetts, to R.A.F. Depot, on appointment to a Temp. Commn. on being seconded from the Army, 4/1.

The undermentioned Flying Officers are all posted to the R.A.F Depot, on appointment to S.S. Commns, 3/1:—N C. Bretherton, F W. Wiseman-Clarke, R. K Emerson, H. W. A. Fox, R. W. M. Hall, J. V. Kelly, T. B. R. Meadmore, R. G. Peckover, R. W. Pilling, H. G. Radcliff, E. H. D. Spence, L. P. Winters; R. Legg and C. Lloyd, to R.A.F. Depot, on appointment to Temp. Commns. on being seconded from the Army, 3/1; A. P. White, to No. 1 School of T T. (Boys), Halton), 11/1; R. B. Harnden, to Marine and Arm. Exper. Estab., Isle of Grain, 11/1; J. A McDonald, to No 4 Sqdn., S. Farnborough, 7/1; S. J. Mason, to R.A.F. Depot, on transfer to Home Estab., 28/11; B. C. W. Windle, D.F.C., to School of T.T. (Men), Manston, 14/1; E. T. St. M. Brett and A. H. J. Howlett, to R.A.F. Depot on appointment to S.S. Commns., 9/1.

Plt. Offs. :—The undermentioned Plt. Offs. are all posted to the R.A.F Depot on appointment to S.S. commns (on probation), 3/2:—W. C. Adams, W. C. Barnsley, W. J. Brett, L. A. Bull, F. E. R. Dixon ,M.C., J. J. Fitzgerald, S. E. Hall, B. F. H. Harding, R. W. Holden, R. O. Jones, H. T. Messenger, F. E. North, C. J. Pavia, J E. Preston, H. W. Raeburn, M. Russell, G. A. Simons, H. G. Slater, F. T. Stace, H. Thomas, A. D. B. Trevor, G. M. Pitts-Tucker; W. Wynter-Morgan, M.C., to R.A.F. Depot, on appointment to a S.S. Commn. (on probation), 4/1.

The undermentioned Plt. Offs. are all posted with effect from 9/12 on appointment to Perm. Commns from R.A.F. (Cadet) College, Cranwell:—G. C. A. Armstrong and J. E. Hutchinson, to No. 56 Sqdn., Biggin Hill; H. R. F. Baxter, E S. C Davis and E. A. McKinley-Hay, to No. 7 Sqdn., Bircham Newton; F. W. L. C. Beaumont and L W. Dickens, to No. 207 Sqdn., Eastchurch; C. C. Edwards and J. E. G. H. Thomas, to No. 11 Sqdn., Duxford; J. L. F. Fuller-Good and W. C. Ward, to No. 11 Sqdn., Bircham Newton; H. M. Groves, C. W. Moss, M. D. Ommanney and R R. Reedman, to School of Army Co-operation, Old Sarum; R. B. H. Jackson, to No. 32 Sqdn., Kenley; N. W. F. Mason and W. J. P. Sloan, to No. 39 Sqdn., Spittlegate; N. Young, to R.A.F. Base, Leuchars.

Medical Branch.—Flt. Lts. (Medical) T. M. Walker, to Palestine General Hospital, 21/10; F. E. Johnson, to H.Q., Iraq, 5/12; J. A. Quin, M.D., B.A., to No. 14 Sqdn., Palestine, 16/11; (Hon. Sq. Ldr.) A G. Lovett-Campbell, M.B., to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab., 25/12; A. F. Rook, M.R.C.P., D.P.H., to R.A.F. Hospital, Cranwell, 14/1.

Flg. Offs. (Medical) F. K. Wilson, M.B., to Research Laboratory and M.O.S. of I., Hampstead, for short course, 2/1; W. J. Hutchinson, M.B., to R.A.F. Hospital, Cranwell, 18/1; R. W. White, to R.A.F. Central Hospital, Finchley, 14/1.

Stores and Accountants' Branch.—Sq. Ldrs. (Stores) C. L. Archbold, to No. 1 Stores Depot, Kidbrooke, 14/1; W. Millett, to No. 3 Stores Depot, Milton, 14/1.

Flg. Off. (Stores) A. P. Woollett, to No. 4 Stores Depot, Ruislip, 14/1. Flg. Off. (Accountant) R. W. L. Glenn, to No. 4 F.T.S., Egypt, 11/1.

Chaplains' Branch.—The Rev. J. H. P. Still, B.A., to Basrah Group, H.Q., instead of to H.Q., Iraq, 23/11.

London Gazette.

Jan. 8.

General Duties Branch.—H. C. Evans is granted a perm. commn. as a Plt. Off., with effect from Dec. 20, 1923, and with seny. of Dec. 20, 1922.

The follg. are granted S.S. commns. in the ranks stated, with effect from and with seny. of the dates indicated:—Flg. Offs. (for Seven Years on the Active List).—N. C. Bretherton (Lt., I.A., retd.), R K. Emerson (Lt., I.A., retd.), H. W A. Fox (Lt., R N, retd.), R. W. M. Hall (Capt., I.A., retd.), J. V. Kelly (Lt., R.F.A., retd.), T B. R. Meadimore (Capt., I.A., retd.), R. G. Peckover (Lt., I.A., retd.), R. W. Pilling (Lt., I.A., retd.), H. G. Radcliff (Lt., I A., retd.), E. H. D. Spence (Lt., R.N., retd.), L. P. Winters (Capt., I.A., retd.), F W. Wiseman-Clarke (Lt., R.N., retd.) (Jan. 3).

Plt. Offs. on Probation (for Five Years on the Active List).—W. C. Adams, W. C. Barnsley, W. J. Brett, L. A. Bull, F. E. R. Dixon, M.C., J. J. FitzGerald, S. E. Hall, B. R. H. Harding, R. W. Holden, R. O. Jones, H. T. Messenger, F. E. North, C J. Pavia, G. M. Pitts-Tucker, J. E. Preston, H. W. Raeburn, M. Russell, G. A. Simons, H. G. Slater, F. T. Stacey, H Thomas, A. D. B. Trevor (Jan. 3). W. Wynter-Forgan, M.C. (Jan. 4).

H. R. V. Fowler is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, Dec. 29, 1923.

The follg. Lts. are granted temp. commns. as Flying Offs. on seconding for four years' duty with the R.A.F :—R. Legg (K.O.S.B.), C Lloyd (The Buffs) (Jan. 3); J. Messer-Bennetts (K.O.S.B.) (Jan. 4),

Reserve of Air Force Officers.—J. Ward is granted a commn. in Cl. A, Gen. Duties Branch, as a Plt. Off. on probn. (Jan. 8); Flg. Off. W. C. Pruden is transferred from Cl. A to Cl. C (Apr. 26, 1923); Flg. Off. C. V. Frith resigns his commn. (Dec. 10, 1923).

Jan. 11.

General Duties Branch.—The follg. Offs. on Probation are confirmed in rank:—I. B. Gray (Dec. 29, 1923); G. Coffin (Dec. 20, 1923).

Medical Branch.—Flg. Off. F. K. Wilson ceases to be seconded to the Bristol Infirmary (Jan. 2)

The R.A.F. Staff College.

The following officers have passed the qualifying examination for entrance to the R.A.F. Staff College, Andover, and are selected for the third course commencing May 1, 1924:—

Wing Cdr. J. T. Babington, D.S.O., Sq. Ldrs. A. C. Maund, C.B.E., D S. O., T. W. Mulcahy-Morgan, M.C., R. Collishaw, D.S.O., O.B.E., D.S.C., D.F.C., C. J. Mackay, M.C., D.F.C., N. H. Bottomley, A.F.C., F H. M Maynard, A.F.C.

Flt. Lts. E. M. Pollard, G. C. Pirie, M.C., D.F.C., J. C. Slessor, M.C., L. G. S. Payne, M.C., A.F.C., J. P. Coleman, A.F.C., T. W. Elmhirst, A.F.C., T. E B. Howe, A.F.C., C. H. Keith, J. W. B. Grigson, D.S.O., D.F.C., P. F. Fullard, D.S.O., M.C., A F.C., J. H. Green, L. N. Hollinghurst, D.F.C., C. J S. Dearlove.

The R.A.F. Cadet College.

The following is a list of cadets who successfully completed in December, 1923, their course of training at the R.A.F. (Cadet) College, Cranwell. The names are arranged in alphabetical order:—

Armstrong, G. C. A. (Winner of Sword of Honour and R. M. Groves Memorial Prize), Baxter, H. R. F., Beaumont, F. W. L. C., Davis, E. S. C., Dickens, L. W., Edwards, C. C., Fuller-Good, J. L. F., Groves, H. M., Hutchinson, J. H., Jackson, R. B. H., Mason, N.F.W., McKinley-Hay, E. A., Moss, C. W., Ommanney, M. D., Reedman, R. R., Sloan, W. J. P., Thomas, J. E. G. H., Ward, W., Young, N. (Winner of Abdy Gerrard Fellowes Memorial Prize).

The Gallant Four Hundred

The statement issued last week that the Royal Air Force wants 400 Short Service officers ought apparently to have been qualified by the statement "in the course of the year 1924." As already mentioned something like 120 applicants arrived in person the first day after the notice appeared in the press and about 100 others invaded the Air Ministry next day. Over and above these undisciplined but enthusiastic 200 and odd young men applications to the number of something like 4,000 were received by post. Whether this indicates violent enthusiasm for aviation among the youth of England or whether it merely indicates lack of employment would be hard to say. One can imagine that the already overworked officials at the Air Ministry may not be grateful for this sudden influx of extra work but the enormous number of applicants does at any rate give the Selection Committee of the Air Force a chance of getting 400 very good men out of the 4,000. Thus perhaps the emitter of the notice and the omitter of the qualification may be forgiven.

Short Service and Reserve Officers.

The Air Ministry announces:—With reference to the announcement issued last week that 400 officers were required, during the current year, for flying duties under the short service commission scheme of the Royal Air Force, it is desired to intimate that sufficient inquiries for application forms have been received at present. When the present inquiries have been dealt with a further announcement will, if necessary, be made.

It was also announced recently that approximately 200 pilots were required for flying duties in the Air Force Reserve of Officers and, in this case, further applications to join the Reserve are desired from those who served as pilots in the flying services during the war or who hold civil licences to fly commercial aircraft, particularly from ex-pilots residing in Scotland, or in the counties north of the Trent.

Aerial Survey at Singapore.

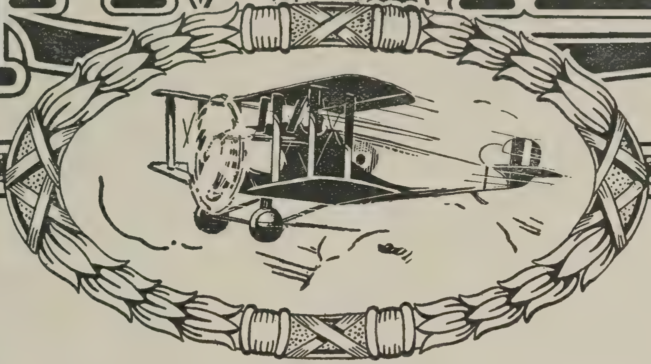
The Times of Jan. 11 states:—

A number of Royal Air Force officers, including Sqdn. Ldr. Tomkinson, are being attached to the Cattewater air station at Plymouth, which is now in the charge of a maintenance party only, for the purpose of organising a development flight in connection with the Aircraft Carrier *Pegasus*. The *Pegasus* is next month going on a journey to the East Indies for survey work, and although no official announcement has been made, it is believed that a certain amount of survey work at Singapore will be carried out and that the aircraft flight will be used to assist in photographic and other surveying from the air for the proposed naval base there. The *Pegasus* has only recently returned from the Mediterranean, and is a vessel of just over 3,000 tons converted for aircraft duty.

The Trans-Atlantic Airship Service.

It is announced that the long-promised service of passenger-carrying Zeppelin airships is to be established shortly between Seville and Buenos Ayres. The ships will be capable of carrying forty passengers and about twelve tons of freight and the voyage normally will take four days. "Shortly" = "Mañana" (probably) on the principle of "jam yesterday, jam to-morrow, but never jam to-day."

HAWKER



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First successful flight,

Wright Assembly Plant—Kittyhawk, 1903

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to meet the military re
Today this great orga
and principles establish
years ago are furthering
plane and engine design

WRIGHT AER
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"The
Identification of
Incomparable
Service"

W R

-Kittyhawk, N. C., 1903

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aeronautical engineering
made possible the design-
engines in huge volume
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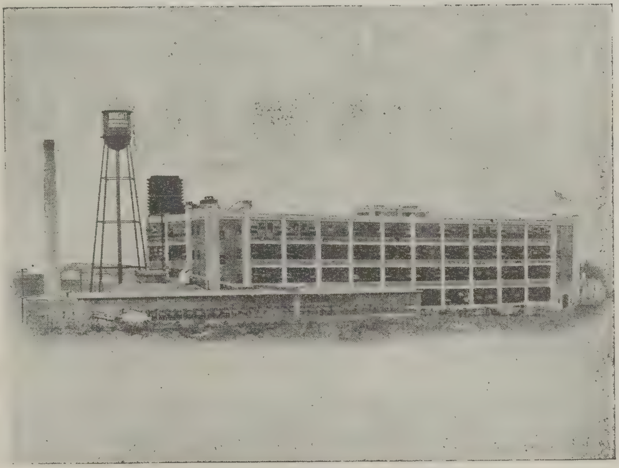

Wright Plant—Paterson, New Jersey, 1923

WRIGHT · AVIATION · ENGINE

"The
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Service"

WATER-COOLED AERO ENGINES.

Mr. Rowledge's paper bearing the above title, which was read before a joint meeting of the Institution of Automobile Engineers and the Institution of Aeronautical Engineers on Wednesday, Jan. 9, contained a good deal of evidence as to the secret of Mr. Rowledge's success as an aero-engine designer. To a very large extent it was concerned with those aeronautical considerations which condition the design of engines. In the opening paragraph the author pointed out that as the engine designer is not usually also an aeroplane designer he often finds it difficult to place the true relative value of the various points in his engine specification, and invited criticism from aeroplane constructors to confirm or correct the ideas set forth.

Mr. Rowledge remarked that from the earliest days of flying both the air-cooled and the water-cooled type of engine had been used for flying and that both would probably continue to be used, as neither had reached the limit of possible development and each had special advantages making it suitable under certain conditions.

At the same time he claimed that almost all the great performances in the air had been accomplished with water-cooled engines and that it might be expected that it would always be possible to build a faster machine with a water-cooled engine than with an air-cooled engine.

Lightness and Reliability.

Low weight per h.p. was a very important factor. If the consideration of weight is taken to cover the weight of the whole power plant against the thrust h.p. developed, the question of the suitability of an engine is almost entirely covered.

Reliability is an obvious requirement and one that engine designers would be prepared to admit must be more fully met. Length of life is much tied up with reliability although actually a separate question. Economy has to be considered in its widest application covering first cost, running cost and maintenance cost. The efficiency of the engine was mainly important in so far as it affected the question of weight.

A good deal had been heard of engines using heavy oil and it was assumed that such engines would increase safety and reduce running costs. The question of safety against fire could not be lightly dismissed. At the same time with proper design and installation the risk of fire with petrol engines, even in a crash, could be made extremely small. The direct injection heavy oil engine was in a very early stage of development for air use and has yet to make a place for itself. If the system meets with success it will solve many outstanding problems.

Economy and Cheapness.

The question of economy requires more than superficial consideration. It is of little use to have an engine that can be built cheaply and which will use a low-priced fuel if that engine has a poor performance, and requires to be of greater horse-power and requires a larger and more costly aeroplane to perform the same duty. This is what happens if the weight per h.p. of power plant is increased.

All aero-engines had been designed for war purposes. That they were of use for commercial aviation showed that the requirements for some types of military machines were very nearly the same as for commercial work. A successful aero-engine is very costly to make and put into production, and commercial aviation was handicapped by the fact that it did not demand enough engines of one type to warrant designing for its sole use.

Variable Airscrews and Gears.

One subject which was worth investigating and which will have a great effect in determining the best type of aero-engine is the provision of either a variable pitch airscrew, or alternatively a variable speed gear. It was unfortunate that the variable pitch airscrew had not made more progress—the alternative of a two-speed gear was now being designed and constructed. A good gear of this type did not appear to present a difficult problem—and was easier to deal with than a variable pitch gear. It was rapidly becoming the practice of civil aviation firms to run their engines as though they were on low-gear all the time. The two-speed gear would give the advantage of improved reliability and better fuel consumption cruising, for the engine could be run at lower r.p.m. and higher brake M.E.P.

In designing an engine one had to decide the number of cylinders, the arrangement thereof and the bore and stroke to be adopted. Experience showed that a fairly long stroke giving a good shaped combustion chamber was desirable for efficiency. If the stroke was too long it was difficult to get big enough valves in the cylinder—a stroke/bore ratio of 1.4 was desirable. There were two schools of aero-engine design—the low-speed and the high-speed. One advantage of the high-speed type was that a higher compression could be used without detonation. High piston and revolution speeds kept down weight. But unless the aeroplane for which the engine was intended was a very high-speed one it was necessary to use gearing between airscrew and engine in order that both might run at their best speed.

The efficiency of gearing was very high—in fact it was difficult accurately to measure the loss—and satisfactory gearing could be built for less than 0.25 lb. per B.H.P. For the same power plant weight one could build an engine roughly 10% larger if gearing was left out, but a good deal of this extra power was lost on the airscrew. It was necessary to burn fuel and provide cooling for the increased power, so that the overall efficiency of the power plant fell. In practice Mr. Rowledge expresses the belief that results are much more in favour of low airscrew r.p.m. than a first investigation might suggest

If gearing is essential then it appears necessary to have at least 12 cylinders to keep the torque sufficiently uniform to avoid trouble with gearing, and probably 12 cylinders was all that were necessary up to 750 h.p.

For arrangement there was choice of the twin-six, the triple-four and the radial. Radial water-cooled engines were not in favour in this country probably because the frontal area was at its maximum in this type. There was little to choose between the twin-six and the triple-four.

Advantages of Water-Cooling.

Water as a medium for cooling possessed many advantages to off-set the apparent simplicity of air-cooling. The high specific heat of water allowed it to absorb a lot of heat without undue rise of temperature. It prevents the formation of local hot-spots—an important point making for reliability and economy. It allows the cylinders to be arranged in a form giving low head-resistance, and they can be placed close together giving a compact and light engine.

Mr. Rowledge suggested that in the future pressure loading of the radiator system would probably be used, thus increasing the maximum temperature of the cooling system and so reducing the radiating surface required.

He also suggested that in the future important air racing would be run under rating rules as unless this were done racing would be killed by the expense thereof. A limit to the size of racers would not limit their usefulness as an aid to progress.

On the subject of central engine rooms with gear drives to airscrews, Mr. Rowledge expressed the opinion that the weight of clutches and gears was so serious a handicap that better results in the matter of freedom from complete breakdown could be obtained by suitably disposed independent power plants on the wings.

A very considerable portion of the paper was devoted to description of more or less standard practice in regard to design and installation, and this portion of the paper cannot be dealt with here—not because it lacks interest but because there is more of it than can be compressed into the space available.

The Discussion.

Brig.-Gen. Bagnall-Wild congratulated the author and the Institution on having brought aeronautical and automobile engineers together to discuss the Aero-engine. He had always believed that they could help each other more than they had so far. Personally he felt certain that the air-cooled aero-engine would yet come into its own for short range work. It had not yet been proved which was the best for really high-speed work, particularly for service high-speed work. The speeds attained with water-cooled engines in America had been attained by the use of wing radiators—which presented far too large a target to be used on fighting machines.

Different types of reliability were required for different purposes—for instance for a racing machine one needed a reliable burst at very high power for an hour or so whereas for long-distance commerical work one needed the capacity to run for a long total time in runs of several hours each but not at maximum output.

Bulk production of aero-engines was impossible at the moment but it was essential that we should be ready to undertake such production at short notice. He was not happy about the state of the variable airscrew which was not yet a satisfactory proposition. The American forged duralumin airscrew seemed to be of great promise, for it seemed to open the way to an abolition of the reduction-gear. He thought that the time had come to consider the abolition of the cast crankcase in favour of a built-up girder covered with sheet-metal.

Fuel was somewhat of a difficulty. They desired to standardise fuel for aero-engines and it was essential that their fuel should be obtainable from an Empire source. He agreed that the heavy oil engine was not yet ready, but when they

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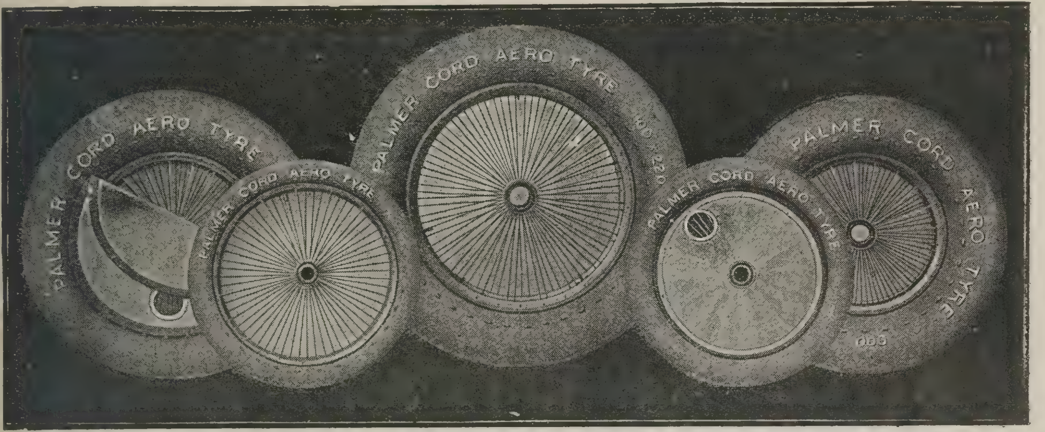
LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82*	185.	55.	135/50
,,	85*	185.	55.	Central
,,	36*	185.	55.	135/50
,,	40	185.	60.32	135/50
,,	152	185.	66.67	135/50
,,	163	185.	66.67	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60
,,	141	250.	80.	Central
,,	201	185.	60.32	125/60

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 36, 40 and 163 are of stronger type than the other wheels for 800 × 150 tyres.*

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U/N/NN.

got it they would have achieved one very happy result—the suppression of the magneto—which was of great importance from the wireless point of view.

Mr. A. P. Thurston thought that Mr. Rowledge had claimed too much for the water-cooled engine. He said that all great performances had been accomplished with the water-cooled type—but had not the Gnôme, the Rhône and so forth put up one or two really great performances? As a matter of fact he believed that in the near future the South Kensington Museum would be the only place for water-cooled engines. Mr. Rowledge had given away water-cooling when he had said that its use was in the prevention of local hot-spots. Local hot-spots were due to errors of design, and water-cooling in fact served to cover a multitude of sins.

Lt.-Col. Bristow said that the lack of co-operation between aeroplane and engine designers was the fault not of the designers but of the War which interposed difficulties of communication. It was not until civil aviation began that it was possible to establish direct communication between aeroplane and engine designers and the users of their products and to collect useful data as to the life and the cost of running of engines and aeroplanes. As a result it was now possible to say that the principle defect of the aero-engines for commercial work was that they could only carry four lbs. of useful load for each h.p.

If the price which they had to pay for a more reliable and cheaper engine was an increase in weight of 1 lb. per h.p. the price was not worth paying—for it reduced their revenue-earning capacity by more than the whole operating cost of present engines. Low maintenance cost was desirable, low weight per h.p. was essential. On this ground he was sceptical as to the heavy-oil engine.

On the existing air lines which ran generally East and West prevailing winds were South-West and North-East, which meant that on either out or home journey they encountered a head-wind averaging 15 and rising to 35 m.p.h. The present 100 m.p.h. cruising speed of aircraft was none too high to meet these conditions. Recent trials of light aeroplanes had shown that very heavy loads per h.p. could be carried—but at low speeds. By the time they had raised the speed of machines based on light aeroplanes to 120 m.p.h. the weight per h.p. would come up to the present 16 lbs. per h.p. and at the moment he saw no promise of immediate improvement in the aeroplane which would release them from the need of very light engines.

He thought the present need was for the development of engines of very high speeds and high efficiency equipped with alternative gear ratios to suit different types of machines.

A number of other speakers took part in the discussion, and Mr. Rowledge replied briefly to various questions that had been asked. The Chairman, Mr. H. T. Burford, in moving a vote of thanks stated that he had been extremely interested in the paper as he was at present interested in the production of a high-powered, low-speed aero-engine possessing many novel features which he hoped would shortly be running.

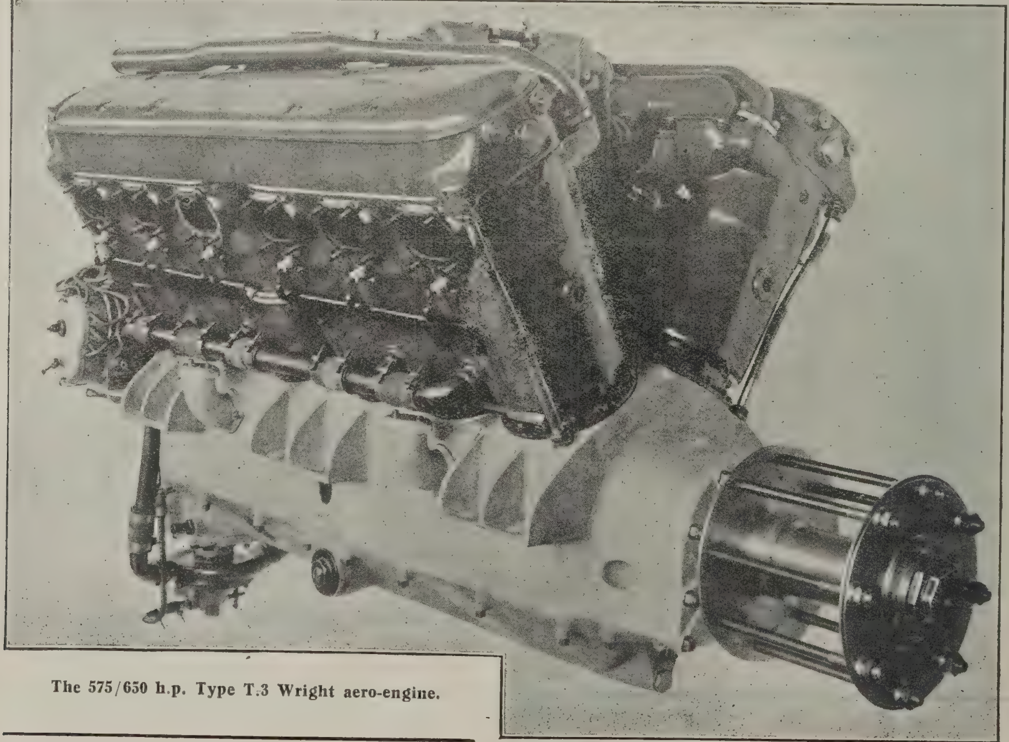
THE WRIGHT T.3 ENGINE.

The Wright T.3 engine is a development of the older T.2 type which has been in production and in service in the United States during the past two years. The T.2 and the T.3 possess the same general characteristics, and cylinder dimensions, and the T.3 is the result of taking an already proved design and overhauling it in detail in order to remove unnecessary weight, to increase durability, and to improve economy. It is claimed that the results of this process have been eminently satifactory.

It has been found possible to set the cylinders of the T.3 a little closer together than in the original model, thus reducing the overall dimensions, to improve the durability of its parts and to increase its output, and at the same time appreciably to lighten it. The first T.3 engine was run on the test bed nearly two years ago, and they have since been subjected to repeated duration tests both on the bench and in the air. One of them is now engaged in test flying backwards and forwards between Washington and Hampton Roads, according to the latest information available (Dec. 20, 1923) has completed 350 hours flying, of which 200 hours are since the last overhaul.

The Wright T-type engines were developed primarily for heavy types of aircraft, and have been used for torpedo-carriers, seaplanes and heavy bombers. But their characteristics of low weight per h.p., their low frontal area and their compactness are such that they are perfectly suitable for high-performance, single-seaters and racers. It will be remembered that the T.3 engine was used in the two Navy-Wright racers which finished third and fourth in the recent Pulitzer Trophy race at an average speed of over 230 m.p.h.

The T.2 and T.3 engines are 12-cylinder, 60° Vees, with each line of cylinders made up of two aluminium block castings.



The 575/650 h.p. Type T.3 Wright aero-engine.

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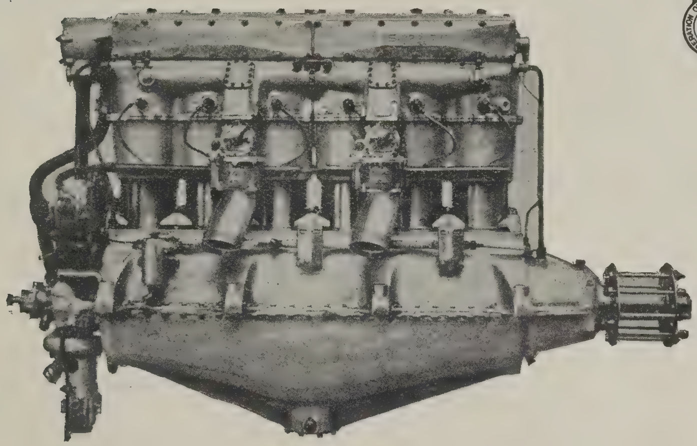

240 h.p. SIDDELEY "PUMA" ENGINE.

BRIEF SPECIFICATION.

Bore, 145 m/m., 5·71 inches
Normal B.H.P., 246
Running Weight, 801 lbs.
Petrol Consumption, 17⅔ gals. per hour.

Stroke, 190 m/m., 7·48 inches
Maximum B.H.P., 255
Running Weight per normal H.P., 3·25 lbs.
Oil Consumption, 10·23 pints per hour.

All Engines thoroughly dismantled, inspected, and given a test run, by an expert staff before despatch.

The "PUMA" ENGINE has proved itself to be one of the most Reliable, Efficient and Economical Aviation Engines ever produced, and we have supplied large numbers of these engines to many Foreign Governments, Air Transport Lines and Aircraft Manufacturers.

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Four overhead valves per cylinder are fitted. In the T.2 type the gap between the two blocks is somewhat larger than in the later T.3 type, and there are separate exhaust ports for each valve. In the T.3 type one single large port serves for both valves. The overhead camshafts are totally enclosed in a casing, the lower half of which ties the two cylinder blocks together. Carburettors are fitted between the cylinder blocks.

Like all American engines the Curtiss T-type drive the airscrew direct at crankshaft speed.

The T.2 type is about one inch longer, one inch higher and one inch wider overall than the new T.3 type, weighs 50 lbs. more, and is rated at 50 b.h.p. less than the newer version.

The characteristics of the T.3 type are given in tabular form hereafter.

Specification.

Bore ......5.75 in. (146 m/m.)
Stroke ... 6.25 in. (159 m/m.)
Piston displacement 1,947 cub. m. (319 litres.)
Length to inner face airscrew flange .... 55.27/32 in. (1.41 m.)
Height overall ...... $29\frac{3}{8}$ in. (.745 m.)
Width overall .... $30\frac{7}{8}$ in. (.78 m.)
Weight dry ....1,100 lbs. (500 kg.) (± 2%)
Max. Power 650 h.p. at 2,000 r.p.m.
Normal Power 575 h.p. at 1,800 r.p.m.

* * *

THE DEVELOPMENT OF FLYING BOATS.

One of the most interesting developments in British aviation of late has been the Marine Airport at Woolston, Southampton, organised by the British Marine Air Navigation Co. Ltd., which is in fact a combination of the Supermarine Aviation Works Ltd. with certain railway interests formed for the purpose of quick communication between Southampton and the Channel Islands and Cherbourg. When it is realised that it takes all night to reach the Channel Islands by the regular boat service and that it takes between an hour and two hours according to the wind in a B.M.A.N. flying-boat one begins to see that here at any rate is an activity in which aircraft can compete advantageously. In the B.M.A.N. Company as in the Supermarine Company the energising power is Mr. Hubert Scott-Paine who since the end of the War 1914-18 has done astonishingly good work in developing flying-boats at the Supermarine Works.

After the long-range coast patrols ceased with the cessation of war flying-boats fell into complete disfavour all round. They were not wanted for regular air line work because the only early air lines ran between London and Paris and even now only include the Amsterdam-Berlin and Cologne services as a regular thing. Consequently there was no use in Civil Aviation for flying-boats. Some effort was made to use small boats in Bermuda for pleasure-flying and on the Orinoco for survey work and the Canadian Government and some of the timber companies have used disposals flying-boats made in the United States for timber patrol but there has been no demand at all for flying-boats in this country though during the War all flying-boat development took place in England.

Naturally the land-going side of the R.A.F. had no use for flying-boats, and since the War the sea-going side, though it has used some of the old Porte boats for instructional purposes at Calshot, has done nothing at all to develop and improve flying-boats. This is due to the fact that the Air Ministry has to provide for the Fleet Air Arm such aircraft as the Navy demands.

The Navy wants deck-flying machines, fighters, fleet-spotters and torpedo-droppers to be used from aircraft-carrying ships belonging to the Navy, with the ultimate object of bringing the machines and their personnel into the Navy. The one thing the Navy fears most of all is the development by the R.A.F. as such of really big long-range seaworthy flying-boats suitable for bombing and torpedo work and operating as home defence aircraft under the orders of the R.A.F. and not under the Navy.

Obviously the development of such a branch of the new Home Defence Area would put the Navy completely out of action so far as the immediate defence of England is concerned. Therefore one can quite understand the Navy's studious neglect of flying-boats. But it is not so easy to understand why the technical side of the Air Ministry has not developed flying-boats with precisely this object in view.

It is true that three or four colossal flying-boats have been built by very good firms strictly to Air Ministry specifications but nearly all these were begun during the War and work on them has not been encouraged with any enthusiasm during the last two or three years. Consequently all of them are now out of date and therefore further work on them appears to be mere waste of money.

In spite of this lack of official progress Mr. Scott-Paine has devoted himself to flying-boat development. His first object was to make a seaworthy hull fly. Not only did he do this but he has also retained all flying-boat records for England since 1916. He has placed English flying-boats in many foreign countries and certain new constructional work at present in progress at Woolston will place the Supermarine Company and English flying-boats considerably ahead of any foreign country.

Since the War the Supermarine Company has built twelve new types of flying-boats, all of them experimental, and eight of those were at the sole expense of the Company itself. One rather thinks that this is a greater number of new types of new machines than has been built by any other aircraft company in England during that period.

Mr. Scott-Paine now looks forward to building up a big mercantile side of this work. When developed this should place beyond all doubt the necessity for a similar sea-going air branch of the Royal Air Force by showing what could and should be done from the sea over the sea by sea-going machines.

One of the most astonishing things about the new R.A.F. Reserve of officers is that there are at present practically no flying-boat pilots among them and it is only during the last few weeks that arrangements have been made for a seaplane centre for Reserve officers at Brough on the Humber. Even then it is doubtful whether the machines will be flying-boats or float seaplanes. Each type has its distinct uses and hitherto flying-boats have been neglected.

The small Marine Airport which already exists at Woolston is an excellent example of Supermarine enterprise. It has all been built at the firm's own expense, slipways, sheds and all. The firm has had to provide and lay its own moorings and provide general facilities, whereas the land-going air lines have all facilities provided at the Government expense.

During the late part of last year an experimental flying-boat service was run to the Channel Islands with quite considerable success. It is a very pretty sight to see one of the flying-boats coming up the river, often smelling its way through fog with a visibility of about 20 yards, or going down river with a following wind taxying at 30 to 40 knots, and then to see it fetch up into the wind, take a tow-line aboard from the attendant launch, pick up its mooring, weather its way onto the slipway and eventually into its shed without noise or fuss, the whole operation being carried out by six men just manœuvring to a bosun's whistle without shouted orders. The whole thing is a thorough seaman's job and gives onlookers vast confidence in the practical commonsense of a flying-boat proposition.

Mr. Scott-Paine holds that flying-boat pilots must be seamen first and that their training to be airmen also will be one of the few difficulties to be met. Launching and handling crews can be whacked into shape easily and so can maintenance men, but the difficulty is that in spite of all our big flying-boat patrols during the War it is most difficult to discover a man who is used to the handling of sea-going machines, launching, slipping, repairing or salvaging.

Considering the immense possibilities for flying-boats in British possessions all over the World it is quite surprising that so little attention has been given to this branch of aviation since the War, and one can only hope that the British Marine Air Navigation Company will meet with so much success in the coming year as to encourage the Air Ministry both on the militant and the civil side to develop flying-boats and flying-boat services to a very much greater extent.

Metal Construction of Aircraft.

Two papers, by Mr. J. D. North and by Dr. Leslie Aitchison, read before the Royal Aeronautical Society on Jan. 10, both under the title of Materials in Aircraft Construction and both dealing with metal aircraft, were among the most interesting papers recently heard at a meeting of this Society. In addition the discussion which followed was certainly the most animated and effective that one can remember of recent years.

Unfortunately it is not possible in this issue to devote adequate space to a report of that meeting which must therefore be held over until the next issue.

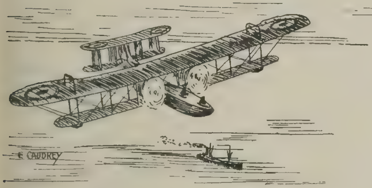
A Help for Light Aircraft.

The Air Navigation (Consolidation) Order, 1923, bearing the date, Dec. 19, 1923, contains among other items a revised schedule of charges for Certificates of Airworthiness for a "Type" Aircraft. Heretofore the charge for such a certificate has been uniformly £75. Now the charge is based on the tare weight, and is £12 10s. for 500 lbs. or less, £25 for 750 lbs. rising to £80 for 2,500 lbs.

Company News.

The following satisfaction is recorded :—

Aircraft Disposal Co., Ltd.—Satisfaction to the extent of £200,000 (balance outstanding) on Dec. 29, 1923, of debentures dated March 11 and 12, and April 22, 1920, securing not more than £1,200,000.



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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 11; Tuesday, 0; Wednesday, 0; Thursday, 6; Friday, 10; Saturday, 10; Sunday, 1.

LONDON—PARIS—ZURICH :

Handley Page Transport, Ltd., machines 6, passengers 15, freight 3,109 lbs.

LONDON—OSTEND—COLOGNE :

Instone Air Line, Ltd., machines 13, passengers 18, freight 16,927 lbs.

LONDON—ROTTERDAM—HANOVER—BERLIN :

Daimler Airway, machines 6, passengers 0.

PARIS—LONDON :

Air Union, machines 8, passengers 8, freight 8,724 lbs.

LONDON—ROTTERDAM :

K.L.M , machines 5, passengers 10.

SPECIAL MACHINES : 0.

Total number of trips by British machines : 25, carrying 33 pas. Foreign machines : 13, carrying 18 passengers.

COMPARATIVE FIGURES :

For week ending Jan. 13 :

Machines, 38; Passengers, 51; Crews, 58; Total personnel, 109.

Corresponding week last year :

Machines, 34; Passengers, 63; Crews, 65; Total personnel, 128.

Corresponding week, 1920 :

Machines, 31; Passengers, 51; Crews, 50; Total personnel, 101.

Corresponding week, 1920 :

Machines, 27; Passengers, 30; Crews, 32; Total personnel, 62.

Croydon Notes.

The snowstorms of last week interfered considerably with the air lines. Conditions were worse on the Continent than they were at Croydon. One of the Daimler D.H.34s had to contend with three feet of snow on the Berlin aerodrome. Snowploughs had to be used to clear a path 100 feet wide and 500 yards long before the machine could take off.

No machines at all were able to complete journeys on Tuesday or Wednesday.

The red strontium beacon which has been placed on the aerodrome is said to be a great success. It is easily distinguishable and can be seen over greater distances in misty weather than other beacons.

A Goliath last week carrying a load of more than half a ton of gold in the form of ingots and coins was forced to land on account of bad weather at Poix. The gold was sent on to Le Bourgêt by car where it passed through the Customs in the usual way.

This particular cargo of bullion was being despatched by a London bank to Switzerland. If a Labour Government comes into power and attempts to bring in a capital levy the air lines should do a brisk trade in carting similarly composed freight loads to similar destinations.

The passenger traffic has dropped off to such a remarkable extent that the Imperial Air Transport Co. Ltd. will have a difficult time ahead making up leeway. It seems rather a short-sighted policy to have let things slide as they have but one supposes that owing to the chaotic state in which things had become involved nothing else could have been expected.

Mr. Lappin of Rolls-Royce Ltd. tells one that the statement in THE AEROPLANE that the Handley Page three-engined machine for the S.A.B.E.N.A. is to have a Napier Lion in the nose is incorrect. That machine will have a Rolls-Royce Eagle IX but one understands that the machine ordered by the Air Ministry for the I.A.T. Co. will have a Napier.

Cloud Flying.

The following letter has been received :—

SIR,—In reply to Col. G. L. P. Henderson's criticism of my letter to you on Cloud Flying, I must say that his letter well bears out the "foggy" nature of the subject, and leaves me with the impression that your correspondent's stability must be so concentrated on his flying that he has none left for the correct interpretation of my letter, or the formulation of his own. I will not deal with the various ways in which Colonel Henderson has contradicted himself, as they are obvious. I would, however, like to deal with the various paragraphs of his letter as follows :—

¶ 1. I am sorry that my letter should be the cause of Col. Henderson's statement that he and his fellow pilots are "a most fearless collection." This is already fully appreciated But I think that the sooner the impression that "it is necessary to be a brave man to fly" is done away with the sooner will the man in the street cease to look upon flying as a "stunt." This will be a big step towards making a success of commercial aviation.

¶ 2. The correct conveyance of a message or statement is dependent on the reader as well as the writer How my statement that "I believe that most commercial pilots in these days appreciate that aeroplanes can be flown in and over clouds" can be construed as being "a cheap gibe" is, I confess, beyond my mentality.

¶ 3. Although I find that other pilots have read my letter and understood its meaning, perhaps the addition of the word "regularly" would make it clearer, so that this criticised sentence would have read : "The reason why they do not regularly fly above fogs. . . ."

¶ 4. My letter was written as a criticism of Mr. Courtney's paper, and therefore the question of writing a eulogy on the work of the pilots at Croydon does not arise If Col. Henderson feels that he wants such a eulogy no doubt someone will oblige My experience of the pilots at Croydon is that they are far too modest to worry about such trifles.

¶s 5 & 6. I thank Col. Henderson for calling attention to my omission. I agree that the altimeter is a very important instrument in cloud-flying, and also that it needs improving.

¶ 7. I do not see any point in this paragraph. It was through pilots doing cloud-flying during the War without instruments that the necessity for instruments became apparent.

¶s 8 & 9. Col Henderson says it is quite a simple matter to go blindly ahead even through 100 miles of invisibility if you know it is clear ahead. I quite agree that this is so with the proper instruments, but I confess I would not call it simple. If visibility on the ground is nil I submit that the pilot is putting the safety of his passengers and the machine entirely on the engine. And if the engine fails then in Col Henderson's own words the result is "only disaster." It is here that I indicated research is required, and I suggested the advent of the three-engined aeroplane as a possible help towards the solution of this problem

¶ 10. I gather from this paragraph that Col. Henderson agrees with me that research is necessary, though he goes rather a long way round to indicate it.

¶ 11. I must again assert that in my opinion it is impossible to fly an aeroplane accurately in thick clouds for any long period without instruments, and I know that my opinion is shared by many other pilots.

(Signed) H. HEMMING.

New Technical Literature.

Aeronautical Research Committee. R. & M No 764 Experiments on Rigid Airship R38 (Z.R.2). By R. A. Frazer and H. Bateman. Price 2s. 6d. net.

R. & M. No. 862. On the Aerodynamic Characteristics of Parachutes By R. Jones. Price 5s. net

R. & M. 874. Preliminary Report on the Forced Oscillations of Aircraft Compasses. By Flt. Lt. R. S. Capon and Dr. A. Lee. Price 9d. net.

(Aeronautical Research Committee publications are published by H.M. Stationery Office, and may be obtained from any branch of that office or through any bookseller.)

The Institution of Aeronautical Engineers, Minutes of Proceedings No. 6. Contents :—Some Controversial Points of Aircraft Detail Design by F. T. Hill; Low-powered Flying by Squadron Leader M. E. A Wright, A.F.C.; Some Aspects of an Attempt to Fly round the World, by Major W. T. Blake. Price 1s. 6d. Published by the Institution, 60, Chancery Lane, London, W.C.2.

The Journal of the Royal Aeronautical Society, No. 157, *January,* 1924. Contents :—Official Notices; Some Recent Developments in Aircraft Instruments, by Major H. E. Wimperis, M.A.; The Practical Difficulties of Commercial Flying, by F. T. Courtney. Price 2s. 6d. Published by the Society at 7, Albemarle Street, London, W.1.

The Retort Courteous.

Just before Christmas there arrived a Christmas card from H.M.S. *Iron Duke*, Mediterranean Fleet, inscribed "One of the 'Bone-Headed Brass Hats' has the honour to wish you a very Happy Christmas." No name being inscribed on the card one wrote to an old friend who had served in the *Iron Duke* asking whether he was responsible for the jest or could identify the writing. The following reply was the result :—

"There are no less than 16 brass hats in the *Iron Duke* and it is inconceivable to me that any of them should be entirely ignorant of your existence.

"You see a certain amount of bone is necessary in the structure of a head sufficiently rigid to support the metallic cover. A complete absence of ossified tissue would necessitate the wearing of a softer covering of the Trilby variety and be more consistent with the following of the journalistic profession, which is well known to include amongst its members a number of fat-heads.

"You should adopt a more conciliatory tone towards brass hats, old man; some of them have been known to do things; and one or to have even flown.

"By the way, how about replying to your unknown friend and addressing it to 'a bone-headed brass hat,' Ward Room, H.M.S. *Iron Duke*? It would be stuck up to be claimed.

One gives the Navy full marks for the reply and one thanks the sender of the very elegant card for his jest.

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The Royal Aeronautical Society.

OFFICIAL NOTICES.

ELECTION OF MEMBERS.—The following Members have recently been elected :—*Fellow* : Major H. N. Wylie. *Associate Fellows* : Mr. F. T. Courtney, Mr. S. H Evans, Captain A E Fanstone, A.F.C., Flt. Lt. R A. de H. Haig, Mr. E. C. Hubbard, Mr. P. A. Ralli, Mr. A. P. Rowe, Mr. P. H. Watson, and Mr. J. D. Williams, *Students* : Mr. R. Vasconcellos de Aboim, Mr. L. G. Brazier, Mr. G. A. Chamberlain, Mr. F. F. Crocombe, Mr. F. J. W. Wingfield Digby, Mr. C. E. T Maguire, Mr. H. A. Miles, Mr. G. Ponsonby, Mr. C. H. Pridham, Mr. W. T. Sandford, Mr. H. C de M. Seaman, Mr. S. W. Slaughter, and Mr. F. Small. *Temporary Honorary Foreign Member* : Lieut. S Kato, I.J.N. *Associate Members* : Mr. A. E. Heatley, Mr. R. L. Preston, Sq. Ldr. G. W. Robarts, M.C., Mr. R. A. Tarleton. *Foreign Members* : Mr. W. G. Brown, Mr. P. Guilonard, Mr. J. L Merrill, Mr. Y. Motomura, and Mr. S. A. U. Rasmussen.

SCOTTISH BRANCH.—*Members* : Mr. B. H. Alexander and Captain A. Kingmill

The next fortnightly meeting of the Society will take place at 5.30 p.m. in the theatre of the Royal Society of Arts, John Street, Adelphi, W.C.2, on January 24th, when Dr. J. E. Ramsbottom, of the Royal Aircraft Establishment, will read a paper on " Dopes and Fabrics."

The January number of the Journal of the Royal Aeronautical Society which is on sale, price 2s. 6d. to non-members, contains the following : " Some Recent Developments in Aircraft Instruments " by Major H. E. Wimperis, O.B.E., F.R.Ae. S., and " The Practical Difficulties of Commercial Flying " by Mr F. T. Courtney, A.F.R.Ae.S.

PERSONAL NOTICES.

DEATHS

HARRISON.—On Jan. 4, near Naziriyah, Iraq, in an aeroplane accident, Flg. Off. Robert Cuthbert Harrison, No. 84 Sqdn., R.A.F., third dearly loved son of the late Edward Harrison and of Mrs Harrison, of " Ascot," St. Alban's Avenue, Bournemouth, aged 23 years.

BIRTHS.

YUILLE.—On Jan. 10, at 152, Cromwell Road, S.W., Cecilia Frances, wife of Archibald Buchanan Yuille, D.F.C.—a daughter

FOWLER.—On Jan. 8, at Belhurst, Herstmonceux, Sussex, to Josephine, wife of Major Bernard Fowler, A.F.C., late R.A.F.—a daughter.

Company News.

BRITISH DEPERDUSSIN AEROPLANE CO., LTD.—W. A. Casson, of 8, Bedford Road, Chiswick, ceased to act as Receiver or Manager on Jan. 8, 1924.

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PATENTS.

THE OWNERS of Patents Nos. 9454 of 1911, relating to "Improvements in Valve Springs for Internal Combustion Engines," and 26447 of 1911 for "Improved means for securing the cylinders to the crank of Internal Combustion Engines," are desirous of negotiating with interested parties for the granting of licences thereunder on reasonable terms.—For information apply to Messrs. Lloyd Wise & Co., Chartered Patent Agents, No. 10, New Court, Lincoln's Inn, London, W.C.2.

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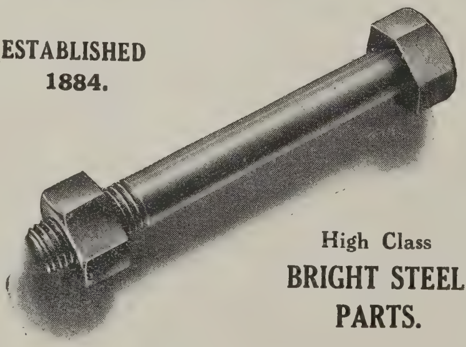

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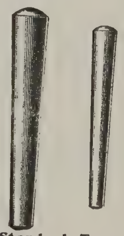

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Edited by C. G. Grey

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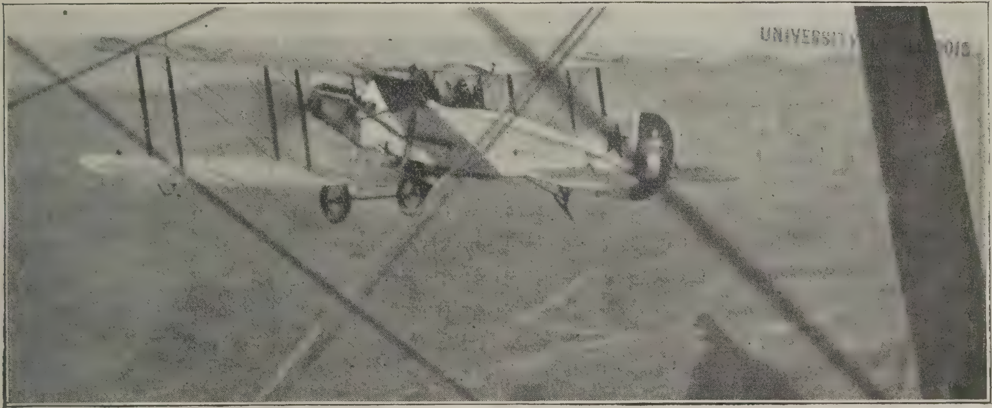
"....AS ENGLAND'S LIGHT ON ASIA ROSE...."



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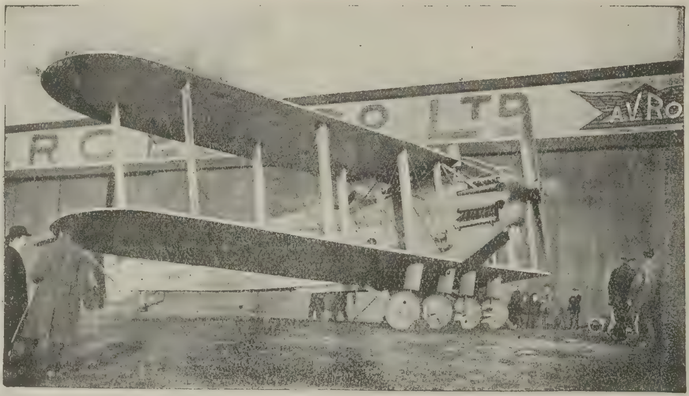
AVRO LEADS AGAIN!



THE machine illustrated is the 1000 h.p. Avro-Napier Bomber.

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JAN. 23, 1924.

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ON THE ORGANISATION OF THE DEPARTMENT OF SUPPLY AND RESEARCH.

The Department of Supply and Research of the Air Ministry which has in effect been the body which has controlled the technical development of Aviation in this country for the last few years has for some time been the subject of considerable criticism from many quarters.

THE AEROPLANE has for long insisted that many of the troubles under which aviation in this country has suffered can be traced to the evil effects of official control over the technical enterprise of the private manufacturer. In other quarters the Department has been criticised on various grounds, and most loudly on the grounds of its alleged neglect of Aeronautical Research.

This volume of criticism has now produced an effect, as may be seen from the following official statement issued by the Air Ministry on Friday, Jan. 18 :—

> THE REORGANISATION OF AERONAUTICAL RESEARCH
>
> The Air Ministry announces a reorganisation of the arrangements for the control of Aeronautical Research.
>
> Hitherto the Director of Research has been responsible, under the Air Member for Supply and Research, on the one hand for the direction of scientific research on all aeronautical matters and on the other hand for the application of the results of such research, as well as of practical flying experience, to the technical development of aircraft, aero engines and all accessories, in order to meet the requirements of the Royal Air Force and of Civil Aviation.
>
> The rapid development of aeronautical science and the increased requirements of the Royal Air Force have now made necessary a re-allocation of the responsibilities of the Director of Research; and as from April next the control of the one side of the work will be transferred to a Director of Scientific Research while the other side will be assigned to a Director of Technical Development. The appointment of Director of Research will then lapse. The Director of Scientific Research and the Director of Technical Development will both serve under the Air Member for Supply and Research. Appointments to the new posts will be announced in due course.
>
> The effect of this reorganisation will be to give scientific research the free scope for development which the recent growth of service and civil flying renders necessary.

The field hitherto covered by the department controlled by the Director of Research is undoubtedly far too wide to be directed to the best results under one responsible head. The present Director, Brig-Gen. R. K. Bagnall-Wild, is well-known to be possessed of great activity, of a very wide knowledge of the technical problems of aviation, and to have done all, or even more than all, that could have been expected of any one man to further the development of aviation. One says this deliberately in spite of the fact that his department has been adversely criticised in this paper and elsewhere.

The new arrangement will at least ensure that the Director of Scientific Research who one gathers is to be essentially a "professor of science" shall become the target for the reproaches of the unemployed advocates of "basic research." This should make it possible for the Director of Technical Development to deal with practical constructors and designers with less of pedantic interruption.

But it may be doubted whether any mere reorganisation of the Department of Supply and Research will seriously change things for the better. The real trouble with the old organisation was that it impeded progress.

It impeded not wilfully but inevitably. The whole business of government is a repressive business. If mankind had no habits calling for repression Governments would be unnecessary. It is a fact that when Governments undertake the control of industrial affairs they undertake control not to encourage Industry so much as to prevent developments which may be considered to be dangerous to the State. Very naturally Government Departments concerned in such control are so constituted that they cannot but discourage any development whose ultimate effect they cannot foresee to their own satisfaction.

The two new sub-departments may in practice keep each other so busily employed with inter-departmental discussions that the Aircraft Industry will be able to proceed about its business in relative freedom. In practice this has often been found to occur, and such a state of affairs does allow enterprise an opportunity.

The two divisions may on the other hand work together so admirably that the Aircraft Industry will find that two powerful obstacles have been raised across the path of progress where only one stood before. The best for which one could hope under these circumstances is the eventual complete nationalisation of the Aircraft Industry. Fortunately complete inter-departmental harmony in such a case is a rare phenomenon and not greatly to be feared.

One aspect of the change however is of hopeful import. If it be true, as alleged, that the post of Director of Technical Development is to be filled by a serving officer of the R.A.F. then the existence of such a post may be regarded as the beginning of the development of a properly trained Corps of Engineer officers in the R.A.F. For it provides at least one really important position the occupation of which may be the legitimate ambition of the keen technical officer.

Such a development is eminently desirable primarily in the interests of the R.A.F. itself, but also very largely for the effect which it must have on the attitude of the Air Ministry as a whole towards Aviation as a whole.

ON THE ROYAL AERONAUTICAL SOCIETY.

The two papers (reported elsewhere in this issue) dealing with metals as Aircraft Materials, read before the Royal Aeronautical Society on Jan. 10 by Mr. J. D. North and Dr. Aitchison respectively, form a welcome change after the series of advance proofs of Aeronautical Research Committee R. & M.'s which have formed so large a portion of the Society's programme recently. And it is noteworthy that these particular papers were followed by a discussion which was very distinctly more animated and interesting than any discussion that has occurred at the R.Ae.S. for many months.

It is difficult to avoid feeling that past or present representatives of the official or semi-official organisations which deal with aeronautical affairs have far too large an influence on the government of the Society and that as a result the extremely valuable scientific work which is carried on by the more enlightened of the technical staffs of the Aircraft Industry tends to be neglected by the Society.

At any rate there is very strong evidence in the poor attendance and in the paucity of discussion which has marked the majority of the Society's recent meetings that things are not as they should be with it, and the success of this particular meeting should serve as an index of what is required to rectify the present state of affairs.

ON PHOTOGRAPHIC SURVEY IN BURMA.

It was notified recently that an aerial photographic survey of the forest lands along the Irrawaddy is being undertaken at the behest of the Government of Burma. The contract for the survey was given to Mr. Ronald Kemp, Inspector of Civil Aviation to the Government of India, who has been lent to the Government of Burma.

Major W. J. C. Kennedy-Cockran-Patrick, D.S.O., M.C., who is the aerial survey specialist to the Aircraft Operating Company, of 8, New Square, Lincoln's Inn, W.C.2, sailed on Jan. 16, to confer with Mr. Kemp as to operations along the Irrawaddy. If conditions are found to be satisfactory Major Patrick will undertake the actual survey work. It is proposed to operate with the Puma-engined D.H.9s on floats from the river, and it is understood that cameras of the old R.A.F. type will be used.

For satisfactory photography of such areas as are required it is probable that photographs should be taken from a height of ten thousand feet, and one doubts whether a D.H.9. with floats and photographic gear will reach such a height in a hot climate. Also one suggests that it would probably have been better either to have acquired more modern cameras, such as the new Fairchild, or to have waited for the production of the latest R.A.F. camera which is said to be extremely efficient.

However one hopes that the survey will be a success, because many people in various parts of the World who are considering having aerial photographic surveys made will base their decisions largely on the success or lack of it of the Irrawaddy survey.

SINGAPORE AND THE OIL SUPPLY.—(Part II.)

By C. G. Grey.

Oil, the Vital Factor.

Great campaigns have been fought for the possession of country rich in manufactures or food supplies. Strategy has directed the capture of certain territory in order to cut off an enemy from his supplies of iron or coal for the making of munitions. Among the most constant objectives of what was called strategic bombing during the War 1914-18 were the iron works of the Saar Basin and the great factories of the Rhineland. In the great war between the Yellow and the White Races the vital material will be oil, for oil will be the motive power alike for aircraft, ships, and army transport, including those important weapons the tanks.

Now, the areas which supply oil are perfectly clearly defined.

Firstly there are the European oil areas—Galicia, Roumania, and the Caucasus, with oil ports on the Danube and Black Sea. In the event of war with the Yellow Races all these supplies would belong at once to the Muscovites (commonly called Russians). The Caucasus supplies belong to them already and the Poles, Czecho-Slovaks and Roumanians could not withstand a Muscovite advance for a week. In fact the Czecho-Slovaks would probably go in with the Muscovites at once as allies, being ethnologically a Sclavonic-Mongoloid mixture.

Secondly there are the Persian oilfields. These belong to Great Britain. More will be said about them later in order to explain why Great Britain holds Iraq and Palestine.

Thirdly there are the oilfields of Texas and Mexico. These are all under the control of the United States, and very rightly the States will want all her oil for herself so that her huge air fleets and sea fleets may be adequately supplied.

Fourthly there are the Dutch East Indian oil fields in Borneo and Java and Sumatra. And that is obviously Japan's only source of oil supply.

Japan's Necessity.

Japan's ally Russia will want all the European oil for her own campaigns against "the Western bourgeoisies" and in any case it would be a colossal job to transport oil from Galicia and the Caspian right across Siberia to Port Arthur for the Japanese. So in order to carry on a war at all after exhausting her stores of oil bought from America and the Dutch East Indies before declaring war, it is strategically essential that Japan shall capture the Dutch oil-fields the chief of which are in Java and Sumatra.

If the Philippines fall easily into the hands of the Japanese then the full force of the Japanese Fleet and Air Force can go straight through to Borneo and Java without much to stop them. The Dutch maintain an efficient but small fleet in the East Indies, chiefly to patrol their waters in search of pearl-poachers, gun-runners to native insurgents and so forth. But the whole Dutch Fleet could scarcely put up a fight against a Japanese battle-cruiser squadron.

Also the Dutch have a very well-equipped and well-manned air force in the East Indies, chiefly composed of seaplanes and single-seat fighters. But gallant as are the Dutch fighting men (being of the same stock as the English we can reckon them as on the same level as our own sailors and soldiers and aviators) they will not be able to do much against the full strength of the Japanese.

American Psychology and World Politics.

If the Government of the United States could be induced to view the situation seriously and to deal with it not merely from the point of view of World Politics but as a matter affecting vitally the whole history of the World, it would man and equip the Philippines with naval and air forces in such a way as to make any attack on them impossible. But the remarkable, or perhaps the most natural, thing about the Americans is that in affairs of World Politics they are more English than the English themselves. Being born and bred on a bigger island than England they have perhaps reason for being more insular. Therefore it is unlikely that the U.S. Government will do anything worth doing until the Philippines have been lost.

Moreover there is in the United States quite a large political party which is all in favour of presenting the Philippines to Japan as a free gift. They regard the possession of the Hawaiian Islands and Guam and the Philippines as a form of Imperialism which is opposed to the democratic principles of the States. One has been told oneself by a former Secretary for War of the United States that the sooner America quits owning anything in the Pacific the better.

Such people are, at present anyhow, incapable of visualising a vast race-war such as was indicated by Lord Grey. That being so they cannot of course see that the cheapest and best guarantee against such a war is a firm alliance between the United States, Holland and Great Britain and an agreement to establish a chain of defence bases from Singapore through the Malay Archipelago to Australia.

Military Pre-Vision.

The position is virtually what it was five or ten years before the war with Germany. Every intelligent soldier and a few civilians knew that the British Expeditionary Force was to hold the post of honour on the left wing of the French Army.

It was assumed that the Germans would attack through the Troué de Belfort on the French Eastern Frontier and the actual camping ground for the British troops was marked out to the North West of Belfort. It was not till the German strategic railways began to appear, with their enormous debarkation yards, right up to the frontiers of Luxembourg and Belgium—instead of in Alsace and Lorraine—that people began to realise that the Germans intended in case of war to attack through Belgium and the Ardennes. It was only then that the French and British General Staffs reorganised their schemes and arranged for the B.E.F. to go to Flanders instead of Belfort and to use Le Havre and St. Nazaire as ports of debarkation instead of the Channel ports.

Incidentally credit should be given to Mr. Prevost Battersby who in the *Morning Post* early in 1914 published complete maps of the German strategic railways showing exactly the German scheme of advance. Our General Staff of course knew all about it years earlier, but those articles and maps gave some few thousands of English people a clear idea of what to expect. And one can only hope that this series of articles may have a somewhat similar effect.

To-day, on a much greater scale, the position is very similar to that of 1904-09. We hold Hong Kong as our advanced base in the Far East. It is as utterly untenable in case of war as our pre-arranged position North of Belfort would have been in 1914, for it is outflanked by China and surrounded by water open to the Japanese Fleet. It is not big enough to hold enough men to defend itself. And anyhow it is not worth defending, for it is of no strategic value whatever if Singapore be in working order.

We withdraw our advanced base (on the left wing of our allies as usual) to Singapore, where we have the whole Malay Peninsula as a direct land communication with India and as a barrier to prevent the Japanese Fleet from getting round our flank, just as the Channel prevented the German Army from getting round our flank in 1914. From Singapore, as already indicated, we can with the help of the States and Holland establish a chain of defences right down to Australia which will make it impossible for the Japanese Fleet to penetrate into the Indian Ocean.

Thus we can establish a loose fighting line for sea and air fighting all the way from Singapore to the Gulf of Carpentaria in the North of Australia, much as in the simultaneous land war in Europe there will be a loose fighting line with fixed ends at Dantzig and the top of the Adriatic with its middle swinging back and forth anywhere between Tyrol and Warsaw.

Any land attack on Singapore from the East side of the Malay Peninsula may be checked by the French in Cochin China and Tonquin—if the French choose to back us in the early stages of the war, and if they do not it merely means that France will lose her Far Eastern colonies, and we shall have to fight a little harder to protect Singapore.

The Defence of East Indian Oil.

It is evident that the swing or sag of the fighting line between Australia and Singapore is a vital factor in estimating the importance and duration of the war. If the Dutch oil-fields could be defended successfully against the Japanese the war could be made much shorter, because the Japanese would soon run out of oil—though it is well to note that at the moment the Japanese are moving Heaven and Earth (quite a lot of earth at any rate) to develop some possible oil-fields in Japan, and if these should by chance prove fruitful they might provide enough oil to keep the fighting services moving.

But it is obviously hoping too much to expect so much foresight and preparedness on the part of three such very Anglo-Saxon-Jutish-Nordic peoples as the English, Dutch and Americans as to make a successful defence of the oil-fields possible or even probable. Therefore it is much safer to assume that history will repeat itself as usual and that we shall all three be driven back in the Malay Archipelago just as we were driven back in France. And it is probable that our flanks will hold at Singapore and the Southernmost Dutch islands much as in France we held onto the Channel

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Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Britanicos.

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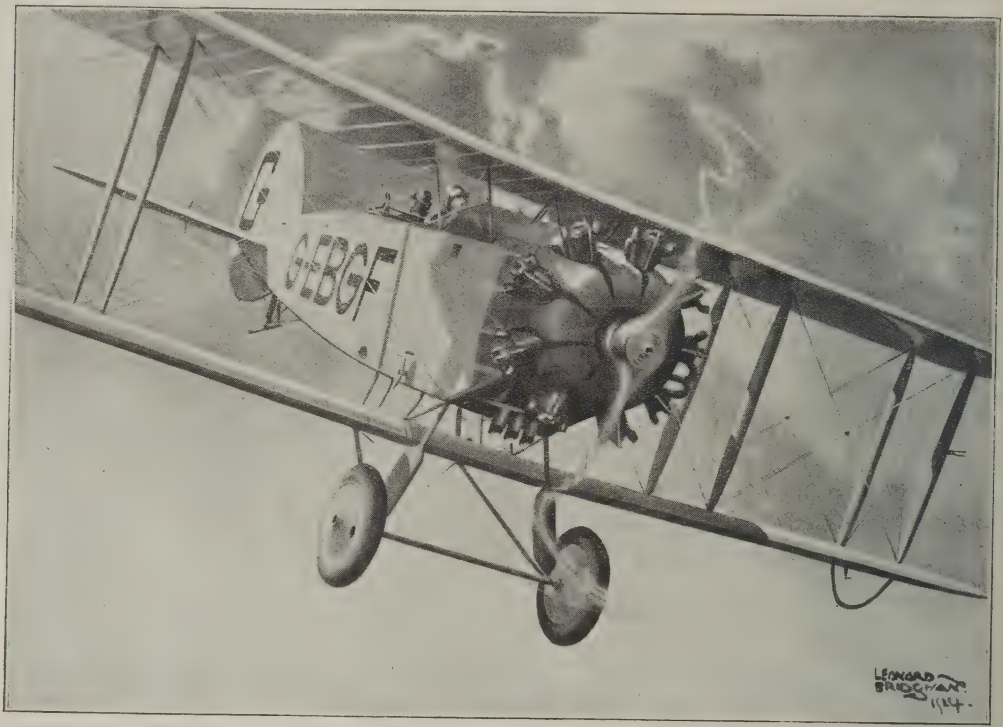

REJUVENATION.—The latest modification of the successful Bristol Fighter of 1916, now fitted with a Jupiter engine. Captain Frank Barnwell, the designer of the original "Brisfit" has recently returned to the firm after a stay in Australia, so new and original Bristol types may be expected ere long.

Coast and at Verdun while the Germans pressed the centre of the line back to the gates of Paris in their first advance.

Singapore and British Oil Supplies.

Therefore assuming that the Japanese do capture the East Indian oil-fields, Singapore assumes a still greater importance, for two reasons:

(A) As a base from which operations must originate to press the Japanese back eastward through the islands till eventually we recapture the oil-fields and the Philippines, and

(B) As a base from which we have to prevent a victorious Japanese Fleet from penetrating into the Indian Ocean, cutting off supplies from Singapore itself, interfering with our Indian trade, raiding our South and East African possessions, and lastly and most important of all, interfering or stopping altogether our oil supplies from Persia and Iraq which reach us by tank steamers down the Persian Gulf, up the Red Sea, and so by the Suez Canal and the Mediterranean to England.

It has been explained already that the Persian oil-fields belong to Great Britain. For strategic purposes the Persian fields may be said to include the oil-fields of Iraq. All Mesopotamia was included in the Persian Empire at one period, just as all Persia was included in the Assyrian Empire at another period, so there is little need to distinguish between them geo-politically.

It has also been explained that the British Fighting Services will have to depend entirely on Persian oil for all their motive power as soon as the war begins, because the Muscovites will have all the European oil and the Americans will want all their own oil. To this statement one may add that the British oil supplies will have to feed the armies and air forces of our allies, the Germans, Scandinavians, Dutch, Belgians, French and Italians, until such time as the Americans discover how much oil they can spare to send across the Atlantic to help us, after supplying their own forces in the Pacific and whatever forces they send from West to East to reinforce us and the Dutch, who will then be working from our bases at Singapore and in Australia and in whatever East Indian islands we may still be able to hold against the Japanese.

Thus it will be seen that the protection of our Persian oil supplies is absolutely vital to the prosecution of the war. It is at least as vital to us as is the capture of the Dutch East Indian oil-fields to the Japanese.

(To be continued.)

Decisions on International Flying by the Federation Aeronautique Internationale.

A Conference was held in Paris on Jan. 2 to 5, 1924. The following countries were represented:—Belgium, France, Great Britain, Holland, Italy, Japan, Roumania, Switzerland, and the United States. Lieut.-Col. M. O'Gorman and Lieut.-Commander H. E. Perrin of the Royal Aero Club represented Great Britain

Schneider Cup: It was decided to run the race under the same regulations as last year. The closing date of entries was fixed April 1, 1924.

Gordon Bennett Balloon Race: The closing date for entries was fixed Apr. 1, 1924.

Tryptique: The detailed arrangements between the Customs Authorities of the European Countries were considered and approved. The Tryptique only applies to private touring aeroplanes and will be instituted very shortly.

Records: *Replenishments*:—It was decided to institute separate records where replenishments are taken in during flight, under the following categories: Duration: Distance: Height: Speed over a given distance.

Height:—It was agreed that it shall not be necessary to return to the point of departure in attempts on Height Records.

Speed:—For Speed Records an excess of eight kilometres per hour shall be necessary to beat the previous record. It was also decided that for greatest speed records over a three-kilometre course the aeroplane must not exceed a height of 400 metres during its approach to the course.

Light Aeroplanes:—The classification of records for Light Aeroplanes was deferred until after the various competitions this year.

1924 *Conference*:—The Conference for 1924 was fixed to be held in Paris beginning June 21, 1924.

Other matters discussed included the Airman's International Atlas, Chronometers, Regulations for Timekeepers, Barographs for Height Records and a competition for Timing Apparatus for Speed Records.

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The Shenandoah's Adventure.

The American rigid airship *Shenandoah* with true American initiative has been busy during the past week proving that the airship is a long way from being a thing of the past.

On the evening of Jan. 16 the ship, which had been undergoing a mooring test at Lakehurst, had broken away from the mast. Next day people at once said "I told you so, the *Shenandoah* has broken loose and will undoubtedly share the fate of the *Dixmude*." It was then learnt that in spite of a terrific hurricane the ship was under control and was actually on the way under her own power and in the teeth of the gale to her base at Lakehurst. By midday it was announced that she was safe in her shed

Had the *Shenandoah* been wrecked it would have gone a long way towards killing the forthcoming airship revival in England. As it is it has done much to restore the confidence which the R.38 and the *Dixmude* destroyed. It is now realised that a properly constructed airship properly handled can live in a storm. Therefore a vote of thanks is due both to the *Shenandoah* and the said storm.

The ship had been moored for four days all except four minutes when a hurricane stated to be blowing at 70 m.p.h. caused such a strain on the ship that the nose-cap came adrift and the ship broke away. On board was a crew of 21 under the command of Lieut. Earl Kincaid, who had with him Captain Heinen, the well-known Zeppelin commander.

This was at 19.00 hrs. She was got under control at once and by 4.24 hrs. the next morning she was safely housed.

There will be an official inquiry into the whole affair. It is at present regarded as a good test preparatory to the *Shenandoah's* proposed trip to the Arctic.

One disbelieves the rumour that the object of the Arctic trip is to fix mooring gear to the North Pole, which thereafter is to be the chief American base for the cold storage of airships under the command of Dr. Cook and his well-known crew of Esquimaux.

The Light Aeroplane Competition, 1924.

A letter to the Royal Aero Club from the Air Ministry dated Jan. 10 announces that the prize to be offered by the Air Council for the Light Aeroplane Competition 1924 will be £3,000. This was referred to the Racing Committee.

Royal Aero Club Acts.

The application for affiliation of the Lancashire Aero Club to the Royal Aero Club has been received and accepted by the Committee.

The Committee of the Royal Aero Club has decided to renew the official recognition of the Society of Model Aeronautical Engineers as the body to control competitions for Model Aeroplanes for the year 1924.

The Annual General Meeting of the Royal Aero Club will be held on Monday, March 31.

The U.S. Army Air Service Budget, 1925.

The total amount of Budget for Air Service, 1925, is 12,435,000 dols., an increase over 1924 of 9,000 dols. Of this there is specified for the purchase of aircraft, engines, etc., 2,854,700 dols. (approximately £600,000), the same amount provided for 1924.

Of the amount for the fiscal year ending June 30, 1922, there remains an unexpended balance of 1,399,001.65 dols. The new bill makes this balance available until June 30, 1925, the 399,001.65 dols. for payments on existing contracts and the 1.000,000 dols. for new construction. There is thus available for the purchase of new aircraft and engines during the fiscal year 1925, 3,854,700 dols. (approximately £800,000).

For experimental and development work, including helium gas, 1,125,000 dols. is appropriated.

Two other items of interest in the budget are 50,000 dols. for the Round-The-World flight and the provision "That none of the funds appropriated under this title shall be used for the purpose of giving exhibition flights to the public other than those under the control and direction of the War Department, and if such flight are given by Army personnel upon other than Government fields, a bond of indemnity, in such sum as the Secretary of War may require, for damages to person or property, shall be furnished the Government by the parties desiring the exhibition."

The U.S. Naval Aviation Budget, 1925.

The total amount for the Bureau of Aeronautics, Navy Department, for the fiscal year ending June 30, 1925, is 15,000,00 dols., an increase of 352,826 dols. over 1924. The amount in 1925 for new construction and procurement of aircraft and equipment is 5,264,826 dols. (about £1,060,000), a decrease from 1924 of 534,124 dols.

The amount in 1925 for maintenance, repair, and operation of aircraft factory, helium plant, air stations, fleet activities, testing laboratories, is 6,716,950 dols., an increase over 1924 of 426,950 dols.

To Brussels by Light Aeroplane.

Mr. Alan J. Cobham who recently took the D.H.53 light aeroplane with a Blackburne engine to the Motor Show at Brussels has sent a very interesting account of his journey.

The machine had been fitted with an extra tank so that it could do the trip from Lympne to Brussels without a landing. In the ordinary way light aeroplanes do not carry compasses but for a cross-channel journey of this sort a compass was absolutely necessary so a Mark 618, which Mr. Cobham regards as the best available compass, had to be fitted and he says when it was in the cockpit it looked nearly as big as the engine.

After flying machines with a cruising speed of 100 m.p.h. he found it rather disturbing to have a cruising speed of about 60 m.p.h. Soon after leaving Stag Lane he ran into rather thick fog and after flying for quite a long time on an approximate compass course thought that he had reached the Thames somewhere about Tilbury. When he came down to identify his position he found himself at the Alexandra Palace only about halfway round London. He was however consoled by the thought "I can just put you down in any old field," and buzzed along at about 600 feet.

When he reached Ashford the wind had dropped and the fog was creeping in from the Channel and he then discovered the possibility of slow flying with a light aeroplane. He found his way into Lympne Aerodrome flying about 40 miles an hour along the hedges and round trees with about 200 yards visibility. At Lympne having taken 1 hour 10 minutes to fly from Stag Lane he refilled his tanks and found that it required a gallon of petrol and nearly half a pint of oil. Even a fast motor-bicycle would take about three hours to get to Lympne from Stag Lane and would use more petrol.

Mr. Cobham crossed the Channel at 3,000 feet to about halfway and then had to come down under a heavy cloud bank to about 200 feet above the sea and in torrents of rain. The crossing took 20 minutes and he arrived over St. Inglevert Aerodrome at about 50 feet from the ground. At St. Inglevert he flew round the wireless mast for quite a long time as he had arranged to be observed there so as to assure the people at Lympne that he had actually crossed the Channel. Eventually a youth crept out of the wireless hut and looked up, so Mr. Cobham then headed for Calais and Dunkirk.

His petrol capacity was supposed to be equal to 3½ hours' flying but after 2 hours 45 minutes the petrol gauge of the tank was empty, though it was understood that when the gauge showed it to be empty there were still two pints of petrol left which means quite a long way on a D.H.53. Still petrol gauges are convincing things so the rest of the way he looked at every field for possibility of landing. As the engine began to show signs of shortage of petrol Mr. Cobham landed at the old aerodrome to the North-West of Brussels having been in the air 2 hours 55 minutes in which time he used a little over three gallons of petrol and about two pints of oil keeping the engine at a steady 3,000 r.p.m.

After two or three hours of telephoning he managed to get in touch with the chief aerodrome at Haren. Here they had been notified of his leaving Lympne but had since had no news. St. Inglevert apparently knew nothing about him and so it was thought that he had fallen into the Channel. Later it was discovered that St. Inglevert had notified Lympne but by the time Haren had got in touch with St. Inglevert the officials there had forgotten about the passing of the 53.

Next morning M. Demonty of the S.A.B.C.A. took Mr. Cobham to the old aerodrome in his little 7 h.p. Citroen and there the wings were taken off the 53 and strapped to the fuselage, the tail was tied to the Citroen and the machine was towed at about 30 miles an hour through the traffic to the Exhibition Salon where it was washed and brushed and put on exhibition and created quite a sensation. There were thousands of inquiries, especially, as Mr. Cobham says, from pale-faced youths who wanted to know the price.

The King of Belgium visited the stand and spent a quarter of an hour talking about the light aeroplane.

After the show was over Mr. Cobham gave an exhibition flight for the Belgian Army at Haren Aerodrome in nine inches of snow, but owing to a snowstorm at Ghent it was impossible for him to fly to England so the machine was taken on a lorry to Ostende and there put on a boat, where only 90 francs (less than £1) was charged for its transport to Dover.

Mr. Cobham's opinion is that at least 1,500 c.c. will be needed for a two-seater light aeroplane and that it must have at least two hours' petrol supply and a cruising speed of not less than 75 m.p.h. if it is to be better than a toy.

It may be remarked that the 1,100 c.c. on which the Air Ministry insists for the two-seater competition this year is purposely fixed on the supposition that an 1,100 c.c. engine specially boosted for a competition would give about the same power as a 1,500 c.c. engine with normal tuning.

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THE PRESENT STATE OF AVIATION IN GERMANY.

[By a German Correspondent.]

Flying for military purposes has entirely ceased to be practised in Germany since the close of the war. One of the terms imposed on the country by the Treaty of Versailles was that all airships, aeroplanes, motors and aerodromes, with insignificant exceptions, were to be destroyed. In many instances this destruction was carried out in a very short-sighted manner and material which would have been of enormous practical value for other industries was simply consigned to the scrap heap. The exceptions were very few, the number of aeroplanes which Germany was permitted to retain for civilian flying and for meteorological research work being limited to about 110. For the sake of comparison it may be added that about 48,000 machines had been constructed in Germany during the war.

The German airships had to be destroyed or surrendered to the Entente. Only one airship is now building at Friedrichshafen for account of the United States Government. It is expected that this vessel will be flown to America. The result of this trip will cause great interest.

Some of the private aerodromes were permitted to be retained by their owners, and are now being used for civil aviation. The Entente has conferred upon itself the right of ownership of some military aerodromes, so that these are not available for German flying enterprise.

All aerial matters are subject to strict supervision on the part of the German Government which is firmly resolved not to tolerate the secret manufacture of either aeroplanes or airships. About one-half of the 110 ex-military aeroplanes saved from destruction have meanwhile become useless. If, as is sometimes alleged, any machines should still be hidden somewhere they are at any rate no longer fit for use now. Exposure to meteorological influences must have disabled their machinery, and their engines—which as is well known were constructed without exception on the water-cooling system—must have been destroyed by corrosion.

Commercial Difficulties.

The 110 ex-military machines left to Germany formed the nucleus of her post-war air fleet. To adapt them to their new purposes they were more or less skilfully converted into commercial vehicles. Soon however it was found that they were absolutely useless owing to the unremunerative principles on which they were constructed, and it was decided gradually to eliminate them from the service, and to use them merely as stopgaps. Remunerativeness had not been aimed at in the construction of military aeroplanes; all that mattered was that they should possess the maximum capacity for rising and moving about in all directions. For commercial machines on the other hand such factors as economic working and maximum carrying capacity have also to be taken into account.

The normal progress of German civilian flying has been enormously retarded by the unfortunate economic conditions ruling throughout the country, and by the special restrictions imposed by the Versailles Treaty and the London ultimatum, which were aggravated by the interpretation of the terms published on May 5 1922. The later regulations go far beyond the intentions of the original Versailles Treaty, and their effect has been to subject the progress of peaceful German flying to such a network of prohibitions that the establishment of normal relations with the flying organisations of the surrounding countries has been made immensely difficult, if not quite impossible.

Owing to these circumstances most of the companies started after the war to take up civilian flying were either wound up after a short time of existence or amalgamated with others, with the result that all the services are now concentrated in the hands of two concerns, namely the Deutsche Aero Lloyd A.G., and the Junkers Luftverkehr. All German companies belong to one or other of these two groups. Even this amalgamation has not made it possible to carry on flying services during the Summer months on a modest scale with more than a fair amount of regularity.

If therefore the German air services lag behind those of other European companies in their regularity and the quality of their machines this is exclusively due to Germany's general economic plight and to the special handicaps arising from the Treaties. The Government cannot take in hand these services itself: it must confine itself to improving the financial position of the privately-owned companies by some paltry grants-in-aid and subsidies. The money spent for this purpose if converted from paper marks into some stable currency is ridiculously inadequate compared with what is done everywhere else.

Owing to the unfavourable conditions ruling in Germany the construction of aeroplane engines has not kept pace with developments abroad, and practically no new designs have been brought about. The only important exception is a new type of engine for small machines, but the builders Messrs. Siemens only supply a limited number of it, and only at long intervals. It still remains to be seen whether the vertical engine with the new type of radiator constructed by Professor Junkers will stand the test of experience. The other experimental engines for small machines are not of much importance.

Two things are needed to stimulate the Industry to greater activity: firstly the necessary funds, and secondly sufficient elbow-room for its unimpeded development. Constructors have either abandoned their new designs altogether because they could not see a chance of translating them into practice, or else they have gone abroad, e.g., to Russia, the Scandinavian countries and Italy, where they are not subject to such restrictions.

Experiments and Science.

The interest taken in flying being now as great as ever, many enthusiasts have turned their attention towards the problem of flying without motors. This will never be an end in itself, but only a means of improving the aerodynamic properties of the flying machine and of training pilots. It will also enable sections of the population to indulge in a new kind of sport. The flights in the Rhön district have shown a general improvement in the machines of this class. Attempts are made to standardise the various types used for experimental purposes and to adapt them to that of the Hannover and Darmstadt machine which proved so successful. The number of persons now engaged in this sport has considerably increased.

The science of aviation is struggling with unparalleled difficulties in Germany since it is handicapped by the want of funds necessary to carry on scientific research, which the Government owing to its own financial straits is unable to supply.

A subject completely neglected in Germany since the armistice is the training of a new generation of aviators, on which not one paper mark has been spent since then. The companies are entirely dependent on the pilots trained during the war.

One of the most important tasks in connection with aviation is the provision that has to be made for a sufficient ground organisation. The safety of the flying services can be immensely enhanced by the existence of good aerodromes and intermediate landing places and by the establishment of efficient signalling and news services. The necessary arrangements in this respect have hitherto been made by local bodies, although it is really indispensable that the Government should take up this matter itself.

The Understanding with England.

British Civil Aviation interests as represented by Daimler Hire Ltd., have been permitted by the German Government to send their machines across German territory on the London-Hamburg-Berlin route, including such as according to the definitions published on May 5 1922 must be classified as military machines, the use of which not even Germany herself is allowed within her own frontiers.

This arrangement may prove of far-reaching importance in the future, although the agreement thus arrived at between the two Governments has not taken the shape of an International Treaty. The German Government is anxious to show that it does not intend to raise any obstacles to the progress of civilian flying enterprise.

The joint working of the route has so far been effected without any hitch, and to the mutual satisfaction of both parties. All sections in Germany interested in flying matters hope that this first step may be followed by others of a similar kind, and much regret is expressed everywhere that German aviation owing to the obstacles enumerated above is prohibited from showing what it can do on that international highway.

The French Attitude.

The attitude taken up towards the governments of France, Belgium, and Poland is entirely different. The reasons are not far to seek. France moreover has tried to force Germany to permit the passage of her aeroplanes across German territory. The practical outcome may be seen on the route from Paris and Strasburg to the Balkan States. The service indeed is in the hands of the Compagnie Franco-Roumaine; but there can be no doubt that in this case we have to deal with a purely military and political undertaking. This becomes at once evident when the small number of passengers carried and the unremunerativeness of the service are taken into account. The expenses of this route, for instance, are 25 times as great as the takings.

The German Government looks upon the machines of this concern as military aeroplanes belonging to a foreign Power

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Saturday Review, 1/9/23.

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passing over Germany without a permit. Repeatedly these machines have been forced to make emergency landings on German territory. In such cases the pilots are allowed to proceed home but the machines are confiscated.

France has assumed rights exceeding those to which the Versailles Treaty entitles her, whereas she ignores the duties imposed upon her. The passage of aeroplanes and airships across Germany will have to be regulated by mutual peaceful agreement on a legal basis; but before that can be done France will have to make real peace with Germany, and compensate her for the wrongs committed upon the numerous German citizens expelled from their homes and deprived of their property, and upon the imprisoned, the wounded, and the killed.

Another aspect of the problem is that the work of rendering assistance to a machine stranded on foreign soil presupposes the existence of good will and mutual confidence, and such confidence can neither be enforced nor obtained by fraudulent means. A successful issue of mankind's struggle against the elements—and against the air in particular—can only be expected if all concerned show a united front.

The relations between German civil aviation and the concerns of the remaining European countries, such as Russia, Denmark, Austria, Hungary, Sweden, Norway, Switzerland, Spain, and the Netherlands have never been anything but pleasant and profitable. Germany has always shown her readiness to co-operate with other countries, and it would be to the benefit of all nations if the exceptional treatment to which German aviation is exposed were to cease. The damage inflicted by the present position is not national but International.

The geographical situation of Germany in the very centre of the European Continent is a fact which no argument can destroy, and for this reason her existence must be taken into account whenever questions affecting trans-Continental flying are concerned. The possession of suitable bases on German territory is therefore of great importance to all nations interested in aviation.

THE ROYAL AIR FORCE.

Appointments.

Week ending Jan. 21.

General Duties Branch.—Air Commodore C. L. Lambe, C.B., C.M.G., D.S.O., to H.Q., Coastal Area, for special duty, 11/12.

Flight Lieutenants: H. H. James, to R.A.F. Depot, 21/1; R. J. Read, to No. 56 Sqdn., Biggin Hill, 28/1; A. R. Mackenzie, to H.Q., Iraq, 5/12; V. R. Scriven, A.F.C., to No. 5 Arm. Car Coy., Iraq, 1/12; R H. Hanmer, M.C., to H.Q., Iraq, instead of to Basrah Group H.Q, as previously notified, 23/11; S. L. Quine, M.C., to Palestine Wing H.Q., 10/12.

Flying Officers C. H. Cahill, to No. 1 Sqdn., Iraq, 5/12; L. T. Kerry, to No. 6 Arm. Car Coy., Iraq, 5/12; H. W. Foote, to H.Q., Iraq, 5/12; B. J. J. Nimmo, to No. 6 Arm. Car Coy., Iraq, instead of to No. 3 Arm. Car Coy. as previously notified, 23/11; C. B. Bond, to R.A.F. Base, Calshot, 21/1; L. S. Hamilton, A. B. Smith, M.C., both to No. 2 F.T.S., Duxford, on appointment to S.S. Commns. for course of instruction, 14/1; G. M. Trundle, to No. 4 F.T.S., Egypt, 12/1.

The undermentioned Flg. and Plt. Offs. are all posted to No. 4 F.T.S., Egypt, for course of instruction, 12/1:—Flying Officers: N. C. Bretherton, F. W. Wiseman-Clarke, R K Emerson, H. W. A. Fox, R. W. M. Hall, J. V. Kelly, R. Legg, C. Lloyd, T. B. R. Meadmore, R. G. Peckover, R. W. Pilling, H. G. Radcliffe, E. H. D. Spence, L. P. Winters, J. Messer-Bennetts, E. T. St. M. Brett

Pilot Officers: W. C. Adams, W. C Barnsley, W. J. Brett, L. A. Bull, F. E. R. Dixon, M C., J. J. Fitzgerald, S. E. Hall, B. F. H. Harding, R. W. Holden R O. Jones, H. T. Messenger, F. E. North, C J. Pavia, J. E. Preston, H. W. Raeburn, M. Russell, G. A. Simons, H G Slater, F. T. Stacey, H. Thomas, A. D. B. Trevor, G. M. Pitts-Tucker, W. Wynter-Morgan, M.C.; V. Harris to No. 2 F.T.S., Duxford, on appointment to a Perm. Commn. for course of instruction, 14/1

The undermentioned Plt. Offs. are all posted to No. 2 F.T.S., Duxford, on appointment to S.S. Commn. (on probation) for course of instruction, 14/1: L. W. C. Annable, E. C. Boucher, G. H. Jennings-Bramly, R W. E. Bryant, S. E. Bullock, J. E. Clayton, R. K. Coupland, P. Cranswick, M.C., H. T. R. Cripps, L. R. Gladwin-Errington, E. H. Fielden, T. H. Finney, G. D. Green, P. P. Grey, G S. Hall A. F. Hutton G. W. P. Irwin, A. J. McKellar, J. C. Marcy, D. W. J. Meager, F W. Moxham, J. F. Nicholas, P. E. Nicholl, E H. L. Pellew, D Robinson, G. W. R. Russell, A. E. P. Smith, V. W. Soltau, C. F. Steventon, J. Summers, W. A. Tattersall, G. D. Venables, F. F. Wilkington J. F. Young

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Medical Branch.—Sq. Ldr. (Medical) H. A. Hewatt, M.B., D.T.M.&H., to Baghdad Combined Hospital, 13/12. Flight Lieutenants (Medical): H B. Troup, to Station Commandant, Iraq, 17/12; M. Coghlan, M.B., to R.A.F. Depot, 26/1. Flying Officer (Medical) F. K. Wilson, M.B., to No. 1 School of T.T. (Boys), Halton, 15/1.

Stores and Accountants' Branch.—Squadron Leader (Stores): H. E. J. Hewitt, to Aircraft Depot, Iraq, instead of to H.Q., Iraq, 23/11. Flight Lieutenants (Stores): D. Mitchell to Aircraft Depot, Iraq, 5/12; W. R. P. Allen, to Stores Depot, Iraq, instead of to Basrah Grp. H.Q., as previously notified, 23/11; T. Fawdry, M.B.E., to R.A.F. Depot, 28/1. Flying Officer (Stores): T. L. Grey, to No. 55 Sqdn., Iraq, instead of to Aircraft Depot, 23/11.

London Gazette.

Jan. 15.

General Duties Branch.—E. T. St Maur Brett (Lt., Indian Army, retd.) is granted a short service commission as a Flg. Off. for seven years on the active list, with effect from, and with seny. of (Jan. 9); Flg. Off. G. Todd relinquishes his S.S. commn. on account of ill-health (Jan. 2); Flg. Off. R. R. Soar, D.S.C., resigns his S.S. commn. (Jan. 16)

Medical Branch.—E. G. Howell is granted a S.S. commn. as Flt. Lt., with effect from, and with seny. of (Dec. 31, 1923); Lt. G. A. Ballantyne, D.F.C., Dental Surgeon, General List, Army, is granted a temporary commission as a Flg. Off. on attachment to the R.A.F. (Jan. 1); he will continue to receive emoluments from Army funds.

Reserve of Air Force Officers.—Flg. Off. W. H. Howell relinquishes his commission on account of ill-health, and is permitted to retain his rank (Jan. 16). The follg. officers are confirmed in rank with effect from the dates indicated:—Flg. Off. A. G. Lamplugh (Dec. 21, 1923); E. A. Jones (Dec. 29, 1923); I. Welby, M.C., D.F.C. (Dec. 30, 1923); W. A. Campbell (Jan 16). Plt. Off. W. F. Jaggs (Dec. 19, 1923).

Jan. 18.

General Duties Branch.—Flt. Lt C. L. King, M.C., D.F.C., is placed on half-pay, Scale B (Jan. 20); Flg. Off. W. J. Cooke is transfd. to the Reserve, Class A (Dec. 5, 1923).

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

R.A.F. v. Leicester:—Playing at Leicester on Jan. 19, the R.A.F. Fifteen beat Leicester by a goal and a dropped goal (9 points) to two tries (6 points).

Eight thousand people attended the match and Leicester had most of the game in the opening stages. When the Air Force attacked Forrest twice almost scored and in a forward rush the ball was taken over the Leicester line, but Coates touched down and prevented any score in the first half. After changing ends Usher got over for the Air Force and converted the try himself. Leicester rallied, Thorneloe scored a try, and then Day scoring after a fine run Leicester were in front. Just before "no side" was called Wale got the ball at the half-way line and dropped a goal for the R.A.F.

The Air Force team were:—Cpl Wale (Flowerdown), Flt. L. C. B. Riddle Gosport), Flt. Lt. O. C. Bryson (Cranwell), Sjt. Snaith (Duxford), Flg. Off. Forrest (Spittlegate), Plt. Off. J. W. Colquhoun (Duxford), Sq. Ldr. J. C. Russell (Staff College), Flt. Lt. R. H. C. Usher (Staff College), Flt. Lt. J. S. Chick (Farnborough), Flg. Off. C. D. Adams (Netheravon). Flg. Off. T. Rose (Netheravon), Flg. Off. F H. Isaac (School of Photography), AC. Collins (Duxford), Cpl. Johnson (Ruislip), A. C. Hampton (Ruislip).

[Incidentally, hearty congratulations to Flt. Lt. W. W. Wakefield, R.A.F. Reserve, who on the same date succeeded in leading England to victory against Wales at Swansea, a place which has on more than one occasion seen the defeat of England even under the aspiring captaincy of an officer of the Senior Service.—Ed.]

Fencing.

The Monthly Medal Competition of the Sabre Club was decided at Bertrand's Academy on Jan. 15, and resulted in a victory for Flt. Lt. Sherriff. Flt. Sherriff was one of the back markers in the handicap and fought throughout extremely well. Flg. Off. Chalmers was second.

In a two-weapon match held at Bertrand's Acadamy on Jan. 16, Bertrand's beat the R.A.F. by 2 events to none.

The results were:—

FOILS:—Bertrand's F A.. Major Stenson Cooke, 3 victories, 0 defeats; E. Rechnitzer, 2 victories, 1 defeat; L. Bernacchi, 2 victories, 1 defeat. Royal Air Force: Flt. Lt. Sherriff, 2 victories, 1 defeat; S G. Stollery, 3 defeats; Flg. Off Chalmers, 3 defeats.

EPEE:—Bertrand's F.A.: E. Rechnitzer, 3 victories, 0 defeats; Pinto Letto, 2 victories, 1 double-bit; Count Lavradio, 2 victories, 1 defeat. Royal Air Force: Flt. Lt. Sherriff, 2 defeats, 1 double-hit; S G. Stollery, 1 victory, 2 defeats; Flg. Off. Chalmers, 3 defeats.

Hockey.

The R.A.F. Hockey XI played Beckenham on the latter's ground on Jan. 12. Beckenham again showed the splendid form which they had previously displayed against the Royal Engineers and had very little difficulty in beating the R.A.F. by 8 goals to 1. The R.A.F. played well, but they still require more practice together and were not nearly so finished a team as their opponents

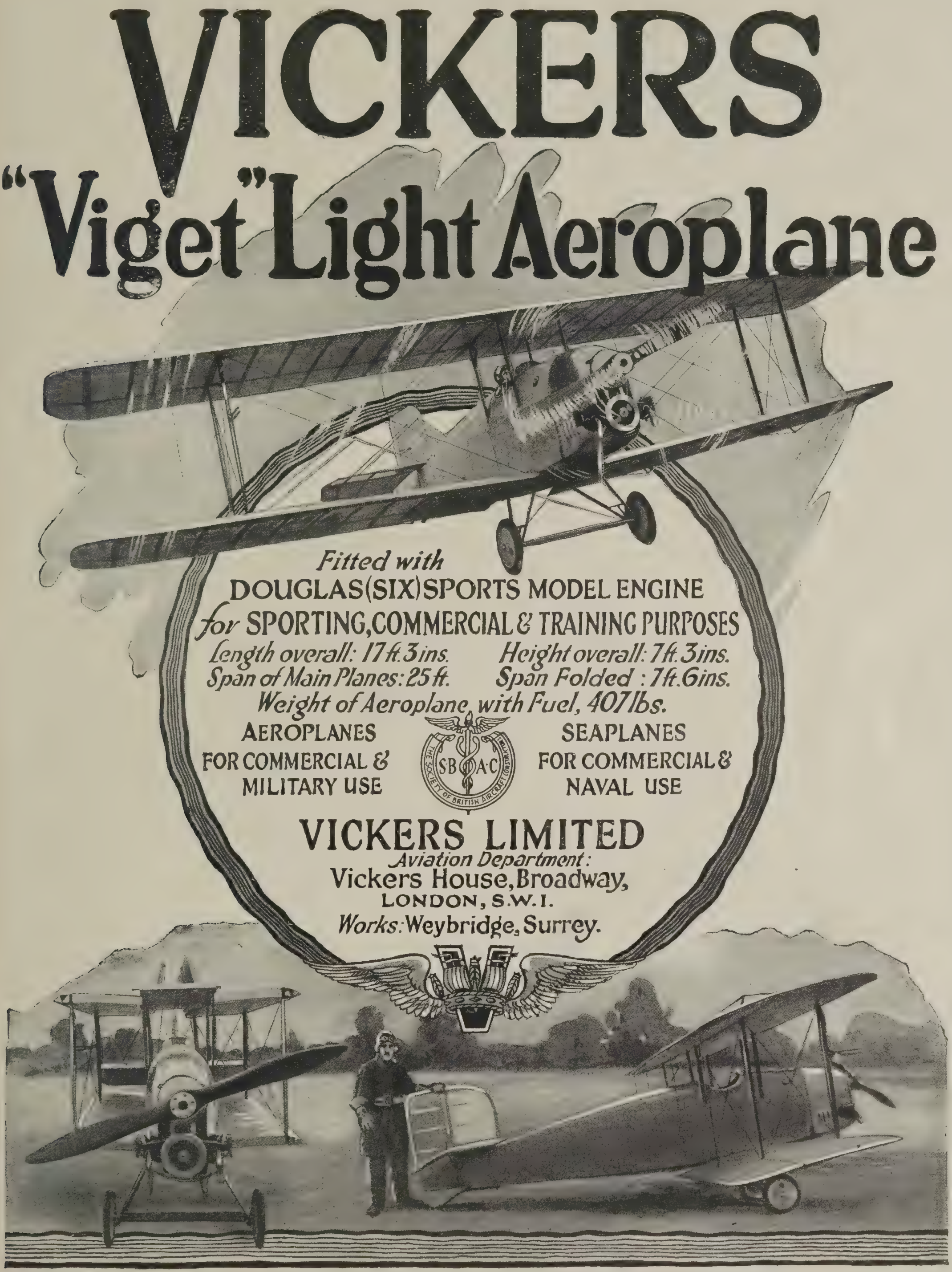
A Friend in Need.

It is reported from Friedrichshaven that the Zeppelin Z.R.3 which is being built for the United States Navy is almost ready. The first trial flight will be made about the middle of March and it is expected that the flight to America will be made with a selected German crew a few months later.

It is further stated that in view of the possibility of the *Shenandoah* discovering any sort of trouble in the Arctic the Z.R.3 will be told to stand by. Where and what she is to stand by is not stated.

Another Point for Control by the R.A.F.

For many years past the English Rugger team under the command of W. J. A. Davies of the Navy have striven in vain to defeat the Land of people's Fathers at Swansea. On Saturday Lt.-Commander Davies was replaced by Flt. Lt. W. W. Wakefield the erstwhile captain of the R.A.F. Rugger Team. England won by 17 points to 9. Verb. sap.



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THE METAL CONSTRUCTION OF AIRCRAFT.

The two papers on Materials in Aircraft Construction read by Mr. J. D. North and by Dr. Leslie Aitchison before the Royal Aeronautical Society on Jan. 10 together form a whole illustrating in a most convincing manner the advantages to be derived from improved materials of construction and also some of the difficulties and dangers which are to be encountered in pioneer work in this direction.

Mr. North's paper—which was perhaps the more generally interesting section of the proceedings, dealt with the practical effects on the aeroplane of improvement in the structural materials employed, the materials in this instance being metals. From the structural point of view, lightness was the special quality of the aeroplane and therefore the materials which should make the greatest appeal to the aeronautical engineer were those which resulted in the lightest structure. But examination of the modern aeroplane shows a general use of materials which do not answer to this description.

In a previous paper before the Society Mr. North said he had already discussed some of the methods whereby very substantial saving in the structure weight of an aeroplane could be attained. By the use of proper materials in all parts of the aeroplane this saving could be very considerably augmented. It had to be considered, when adopting new materials and new methods of manufacture whether they were on sound metallurgical ground—a problem discussed by Dr. Aitchison, and secondly, how manufacturing costs were likely to be affected.

The Value of Weight Saving.

This part of the problem had not been viewed in the proper light. It was generally admitted that weight could be saved, but the full significance of this had not been realised.

The case of a high-performance, medium-range bomber was taken as illustrative. The performance required could only be realised with a power loading of about 10 lbs. per h.p., and four hours full speed fuel was required. For "standard" construction the structure weight of a machine of this class would be 36 per cent. of the total. The 10 lbs. carried by each h.p. then would be made up as follows :—Engine 2 lbs., Fuel 2 lbs., Engine installation 1 lbs., structure 3.6 lbs., and Military load 1.4 lbs.

By using light alloys in the fuel system, by special construction of tanks, and so on the installation weight should be reduced to 0.8 lbs. By the use of high tensile steels and light alloys it was possible to say with confidence that the structure weight could be reduced to 27 per cent. The 10 lbs. per h.p. would then be as follows :—Engine 2 lbs., Fuel 2 lbs., Installation 0.8 lbs., Structure 2.7 lbs., Military load 2.5 lbs.

In the standard machine the military load was 14 per cent., in the improved type 25 per cent. of the total weight. If the required military load were 2,000 lbs. the weight of the two machines would be roughly 14,000 and 8,000 lbs. The two might be pictured as for the first an 80-ft. span biplane with two Rolls-Royce "Condors" and for the second as a 60-ft. span biplane with two Bristol "Jupiters."

Taking engines as costing £4 per h.p. and the standard type of aeroplane at 15s. per lb. gross weight, the standard machine would cost in round figures £16,000.

The Lightest Machine Cheapest.

The 800 h.p. engines of the second machine would cost only £3,200 so that the lightened aeroplane would have to cost £12,800, or £1 12s. per lb. of gross weight to be as expensive as the standard type. Manufactured in moderate quantities the difference in cost per unit weight is nothing like so great as this.

The effective working of the material to produce such a light structure requires a more elaborate engineering organisation, more expensive plant, and a considerable expenditure on tool-making, etc., all of which is of the nature of a fixed standing charge very nearly independent of output, and consequently a rapidly diminishing percentage on cost as the output of a given type increases.

The advantage does not end with prime cost. Cost of engine maintenance is reduced, with the reduction in h.p. the fuel bill is reduced—in this case the standard type consumes 75 per cent. more fuel than the lighter one. Handling and shed accommodation are simplified and a very large saving in operating cost for the same service is indicated.

From the military point of view there is the tremendous advantage of the improved manœuvrability of the smaller machine.

The time taken by the larger machine to execute a given manœuvre would be 75 per cent. greater than that taken by the smaller one.

In the case of commercial aeroplanes loaded to 15 or 16 lbs. per h.p. the saving from lighter construction is not so startling. Probably the prime cost for machines for the same service would be about the same in the two cases, leaving the lighter type with the advantage of reduced running expenses.

The same arguments as apply to construction apply also to equipment. In the type of military aeroplane considered the aeroplane and engine cost £8 per lb. of military load. Every ounce saved on the weight of equipment means a saving of 10s. worth of aeroplane which has both to be bought and maintained. With the lighter type the saving would probably be about 6s. or 7s. per ounce. An examination of standard military equipment is evidence that this point of view is not appreciated by those responsible.

Metals and the Jointing thereof.

Having thus made the case for the light machine built of high-grade materials, Mr. North devoted the remainder of his paper to some consideration of the materials actually available, and of the methods of using them. This section of the paper is difficult to compress and should be consulted in the original. There are, however, one or two points worthy of mention. The use of alloy steel sheet for built-up fittings, which it is said permits of a saving in weight of about 50 per cent. compared to mild steel, raises questions of jointing.

Welding is excluded by the nature of the material. Brazing particularly dip-brazing is attractive, but experience of the formation of cracks has led Mr. North to be very cautious in using this process. In the meantime rivetting and sweating have been utilised and found to meet every requirement. The function of sweating is primarily to relieve rivets and pins from fluctuating stress, though it would be imagined that sweating alone as a jointing process is at least as reliable as glue in wood jointing.

The use of high tensile steel for bolts and nuts calls for a reconsideration of the range of sizes which are to be used. Step of 1/16 in. in diameter are too coarse, and as, thanks to the initiative of the R.A.E., the aircraft industry was long ago robbed of the International Standard Metric system, they were compelled to fall back on the British standard fine-thread in 1/32 in. stages and on the "bastard offspring of the British Association for sizes under 7/32 in."

The exclusive use of copper and brass in the fuel system and of tinned mild steel in tanks offers opportunity for weight reduction by the use of better materials. The extended use of duralumin for cocks and connections and of duralumin or aluminium for pipes in water, fuel and oil systems, seemed inevitable. Tinned steel for tanks might advantageously be replaced by stainless iron, or a nickel-copper alloy such as Monel or Corronil metal. Aluminium tanks depend for success on a petrol-tight jointing process not yet satisfactorily provided.

Exhaust pipes, the thickness of which was determined by the question of scaling, could be made of thinner material if stainless iron or some other metal which does not corrode were used.

Finally Mr. North answers the objection to the use of high-grade materials on the score that they will be abused by those responsible for the maintenance of aircraft. This he considered to be an entirely unsound attitude. There is nothing to prevent the maintenance of aircraft constructed of such materials by skilled or semi-skilled workmen—or even labourers—provided they are under adequate engineering supervision. But Mr. North is careful to point out that an engineering training is not to be acquired as part of a two years' College Course, and that the work of a maintenance engineer is essentially a whole-time job.

The Qualities of Steels and Light Alloys.

Dr. Aitchison's paper dealt with the physical qualities of metals and alloys for the metal construction of aircraft, particularly from the point of view of the reliability of such materials as conditioned by the margin between the ideal or specification strength and the real strength which is achieved in practice.

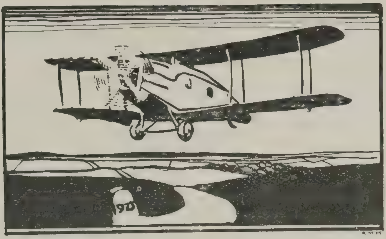
To a very large extent the paper consists of descriptions of the physical qualities of standard metals and alloys and of the effects on them of heat treatment and of cold working. Particular stress is laid on the importance of the qualities of ductility and toughness and on the fact that these qualities—which in general are not to be found in combination with the maximum ultimate strength as revealed by tensile tests—are those which allow material to flow and so relieve itself of concentrated stresses such as may be caused by local imperfections in the material. It is capacity of relieving itself of concentrated stresses by plastic flow which alone makes possible many of the modern applications of metal, and Dr. Aitchison's paper may be regarded mainly as a warning that the higher the quality of the materials used, and the higher the working stresses, the more danger is to be looked for from points of concentrated stress. In fact Dr. Aitchison says "the stronger the metal the weaker the part."

Nevertheless there can be no doubt as to the possibility of guarding against such dangers by proper care. In the first place the proper choice of the appropriate material and its treatment to secure the maximum degree of toughness and ductility is a matter for the designer and constructor. In the second place there is the production of materials free from

MILESTONES

1823

1923



LEADING TO WESTLAND

Thomas de Quincey in his "Confessions of an English Opium Eater," gives a striking picture of the English Mail Coach, the principal means of conveyance a 100 years ago. He says:—

> "The condition of the roads was then such, that, in order to face it, a corresponding build of coaches hyperbolically massive was rendered necessary; the mails were upon principle made so strong as to be the heaviest of all carriages known to the wit or the experience of man; and from these joint evils of ponderous coaches and roads that were quagmires, it was impossible for even the picked breed of English-coach-horses, all bone and blood, to carry forward their huge tonnage at a greater rate *than six-and-a-half miles an hour.*"

1823	1923
6½ miles per hour Maximum.	***90 miles per hour Aircraft Cruising Speed.***

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metallurgical imperfections and of a high standard of uniformity—which is a matter for the metallurgist.

DISCUSSION.

Lt.-Col. Ogilvie (Chairman) opening the discussion, wished to express his agreement with Mr. North as to the vital importance of structure weight and to sympathise as to the callousness of those concerned with equipment. During the war he had always found them impervious to argument on the subject of weight. He thought Mr. North's figure of 36 per cent. for the structure weight of a standard type was excessive.

Mr. W. O. Manning said that Mr. North's paper was a very interesting presentation of the case for the metal aircraft which owed its development so largely to Mr. North's work. He thought that Mr. North in his pre-occupation with metal construction was perhaps not quite aware of the advances made in wooden construction recently and so perhaps had taken a high figure for the structure weight of a standard type machine. On the other hand the figure of 27 per cent. for the metal machine was lower than anything he had heard of except one all-duralumin Breguet. But figures for structure weight had very little real meaning unless the conditions were carefully defined. Mr. North apparently found soldering of H.T. steel satisfactory—he personally had encountered difficulty in securing proper sweating with this material. Stainless steel was undoubtedly a promising material for tanks but did not seem to promise much saving in weight.

As to Dr. Aitchison's paper it seemed to be implied that impact test figures were a satisfactory index of toughness. He understood that the accepted view was that impact test figures did not accurately represent any engineering quality to which known value could be assigned. A state of internal stress in a metal might be very serious—was there any method by which the engineer could discover whether this state existed? Was a large range between the yield point and the elastic limit an indication of internal stress?

Major Bishop said that both papers put the case for the use of the best possible materials. This was a policy that needed resuscitation. In the early days the R.A.E. had attempted such a use of materials, but the difficulties were immense owing to the lack of experience with their use. As a result it was necessary for war purposes to revert to simple materials and to standardise them, and it was now difficult to get away from the standards. He took strong objection to Mr. North placing the responsibility for present standard screw threads on the R.A.F. The factory wished to standardise metric threads, but they got into such trouble with the Ordnance factories for departing from British Standards that they had been obliged to adopt the present system.

Before introducing higher grade materials as standards they must consider whether the Aircraft Industry was in a position to use them. As it was with the simpler materials there were grave difficulties of supply and inspection.

Col. V. C. Richmond said that he thought there was room for a little more advocacy of the merits of wood. It could at least be said that there was no question of staining up wood to meet the needs of design. Thanks very largely to Mr. North the use of the newer H.T. materials was now justified.

Dr. Aitchison rightly emphasised caution in using test figures for fatigue range as a basis for design. There was plenty of evidence from tests that light alloys were not inferior in regard to fatigue. But they still had trouble—particularly in the case of R.A.F. wires—from fatigue failures. Large numbers of R.A.F. wires gave the same failures in the same place, and the remedy he felt sure was not in modification of material or treatment. The trouble could only be met by stabilising the wires against vibration.

Major Bulman said that Dr. Aitchison's paper deserved to be circulated as a calendar to all those who used metals. Fatigue had been discussed from the point of view of the aeroplane. In the engine it had up to the present been sufficient to cut out obvious defects and so avoid fatigue failures during the first 100 hours or so. Engines were now expected to run 2,000 hours or so, and it might be doubted whether the present precautions would meet this condition. To secure soundness of material the purchase and manufacture of high-grade materials must be concentrated in a much smaller number of hands than at present. During the past year or so one particular type of steel had been supplied by no less than twenty different makers. Obviously no maker got a large enough order to encourage him to take adequate care in its production.

Commander J. C. Hunsaker U.S.N. said he was very happy to be able again to attend meetings of the Society and particularly to be in time to attend this one. He thought that America and England were in the same boat as regards the use of duralumin. This alloy was both promising and interesting and certainly offered fewer difficulties of construction than did steel. They had had very great difficulties with H.T. steel. With duralumin they had had numerous fatigue failures and the designer was always blamed for not using the material properly. So far as tests go duralumin seemed to stand fatigue at least as well as mild steel.

Major Mayo said that Mr. North seemed to regard the saving of structure weight in commercial machines as less important than in military types. This was not the case. They were running commercial machines at about 16 lbs. per h.p. and got 4 lbs. useful load per h.p. If structure weight could be reduced and useful load increased it would make the difference between paying and not paying. Unfortunately commercial machines could not be ordered in large quantities, and the initial cost of commercial machines was very important. Could all-metal aircraft be produced at reasonable prices if say 12 machines of a type were ordered?

Major Buchanan agreed that it was important to raise the standard of structural materials. The difficulty was that of supplies—which were acute even with present standard materials. His experience was that owing to complication of equipment the structure weight of aeroplanes was increasing. Aeroplanes were getting too big—shed accommodation alone was a serious difficulty at the present time, and anything that would allow smaller machines for the same service was an advantage. Personally he thought the equipment people were sympathetic and that in time equipment weights would come down. At present they were loaded up with war stock and had to get rid of that.

THE REPLIES.

Mr. North said there was always a discussion as to what structure weight meant. He had included all items not covered in the other items of his weight account. He had not actually reached the figure of 27 per cent. given in the paper, but was certain it could be very closely reached. The figures 36 per cent. and 27 per cent. were relative, they were based on the weight that could be saved. Steel spars could be made half the weight of wooden ones, interplane struts from 45 per cent. to 48 per cent. of wooden struts. All failures of engine mountings, etc., from fatigue that he had met were due to ignorance of the stresses to be met from lack of data as to unbalanced forces of engine, not to failure of material to develop its expected resistance. Induced vibrations caused by engine were usually unimportant because of small amplitude. In the case of Raf wires the oscillations were forced by the instability of the wires and might become serious.

He did not know what Mr. Manning's difficulties in soldering were—all through this use of high-grade material difficulties of procedure were to be met—one had to find out how to overcome them in each case. Most troubles with H.T. materials were due to faults of design or of technique rather. The drawing office work for an all-metal machine was very much more severe than for a wooden one and it was difficult to train draughtsmen for it.

He thought that the production of 12 machines at a reasonable price was quite possible. It was less a question of the size of the individual order than of the total turnover of the works.

He thought building and maintaining expensive aeroplanes to fly obsolete equipment about a very bad way of getting rid of surplus war stock.

Dr. Aitchison said that he wished to remove any impression that he objected to cold working, as a method of hardening. So long as the material was treated so as to give toughness and remove internal strain he did not mind the process employed. Fatigue in aircraft was on all fours with fatigue in any other case. All forms of stress had to be taken into account. It was known that every material had a definite fatigue range and this had been determined by test not to change even for a number of reversals equal to those corresponding to 2,000 hours running at 1,000 r.p.m. in an engine. There was no reason to suppose that the resistance to fatigue of engine materials would change with the life of the engine, but a very little corrosion might entirely change the stress in some cases.

He would not care to suggest any certain method of detecting internal stresses in a piece of metal. A large range between yield point and elastic limit was evidence of internal stress—but it did not follow that internal stress was absent if this indication was absent. Also he did not take impact figure as a measure of toughness. It was an index of a combination of qualities of which toughness was one, and a high value of impact test was evidence that the material was in a good condition as regards toughness.

New Technical Literature

Air Publication 969. Memorandum on Methods of Calculation of Strength of Aircraft for Inverted Flight. Published for the Air Ministry by H.M. Stationery Office. Price 2d. net.

British Engineering Standards Association. British Standard Method for determining Viscosity in Absolute Units. Published by Crosby, Lockwood and Son, London. Price 1s. net.

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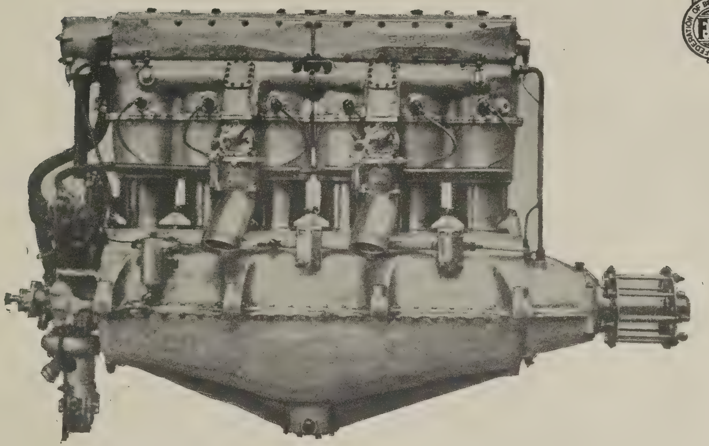

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BRIEF SPECIFICATION.

Bore, 145 m/m., 5·71 inches
Normal B.H.P., 246
Running Weight, 801 lbs.
Petrol Consumption, 17⅔ gals. per hour.

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All Engines thoroughly dismantled, inspected, and given a test run, by an expert staff before despatch.

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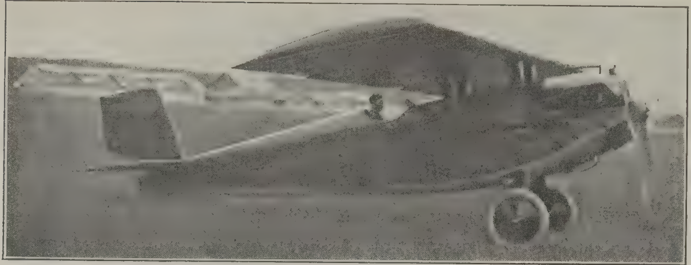


THE DORNIER FALKE SINGLE-SEAT FIGHTER (300 h.p. Hispano Suiza) in its latest form with nose radiator in place of the original Lamblin type.

Since the "Falke" was first produced by the Dornier firm the type has undergone several modifications at the place of its birth, and it has also been taken up in America by the Wright Aeroplane and Motor Corporation.

The Early Days of Aviation.

The paper read by Mr. R. L. Howard-Flanders before the Institution of Aeronautical Engineers on Friday, Jan. 11, proved to be extremely interesting. Although the title suggested that the paper would deal with Brooklands alone, Mr. Flanders in fact dealt with Mr. Roe's early work at Lea Marshes, and described experiences of certain British visitors to the first Rheims meeting, as well as giving a description of life and work at Brooklands between the end of 1909 and the end of 1912.

The first flight on an all-British machine was a hop of about 100 ft. made by Mr. A. V. Roe on a triplane with a 9 h.p. Jap engine on Lea Marshes on July 13th, 1909. Mr. Flanders, who was then one of the devoted band of Mr. Roe's assistants, gives a vivid picture of the conditions under which work was carried out in those days. The average programme, he says, was two weeks work, a hop of 50 yards, crash, and then work again. Until the crossing of the Channel, the work was carried on amid the jeers of such few onlookers as were present. After that event sightseers became a nuisance, even to the extent of causing traffic delays which led to complaints by the police.

Prior to this—in 1908—Mr. Roe made some attempts at flight at Brooklands, but it was not until Pegoud's visit in Oct., 1909, that real flying occurred there. Following this visit sheds were built and Brooklands became an aerodrome, and in a very short while was the scene of great activity. The physical conditions under which the early inhabitants of Brooklands had to work were very far from comfortable. Hours were long, money scarcely existed, and the world at large was unsympathetic.

Nevertheless the keenness of all concerned, and the spirit of camaraderie which existed among the community compensated for the purely material hardships of the time and rendered those days a period to which all who had any experience of them will look back with regret.

Mr. Flanders' account is enriched with a fund of anecdote as to some of the curious happenings of that period which unfortunately cannot be reproduced here. Certainly all survivors of the period in question, and all those whose interest in aviation is sufficiently developed to appreciate the debt which is owed to the early pioneers of the art should take steps to secure a copy of the Minutes of the Institution, which will contain a full report of the paper when in due course it is published.

Mr. Flanders puts the end of the heroic period of aviation as coinciding with the end of the Military Trials in 1912. Then, he says:—

> Aviation became a Trade. Those who had worked for the love of the science, asking only the poorest food and lodging, were either dead or bankrupt, and so finished days which can never be repeated. This example of a group of men sacrificing everything for their work has been seen in steam, electricity, motor-cars, etc., but never in the form shown in aviation, because the earlier engineering sciences did not necessitate living in communities as did aviation. It is improbable that anything of the sort will rise again because money has apparently become definitely the key to all progress. The next openings in science will probably be too elaborate for the needy worker.

Following the paper, the Chairman, Mr. Molesworth, Mr. W. O. Manning, Mr. A. P. Thurston, and Capt. Sayers contributed reminiscences of Brooklands and confirmed Mr. Flanders' regrets for the days that have now passed.

Italian Aero Engine Progress.

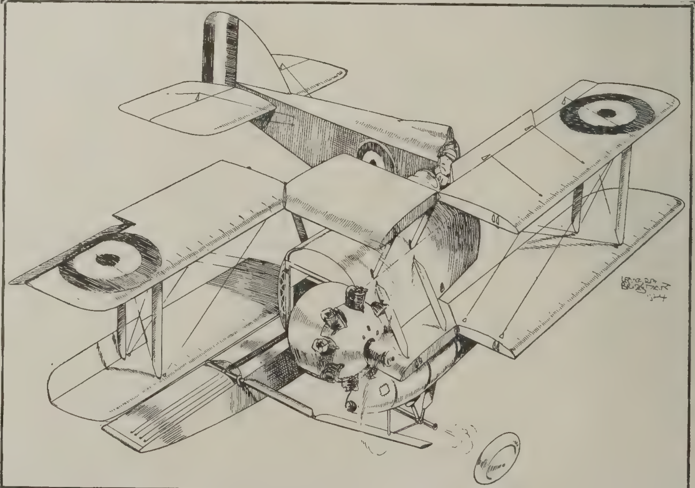
The encouragement given by the Commissariato d'Aeronautica to the construction of modern type of aero-engines will shortly bring forth several new types.

A 12-cylinder Vee engine of 450/500 h.p. is being completed by the Fiat company. It is to undergo its tests very shortly prior to competing in the French Aero-Engine Competition. This firm is also building a 12-cylinder Vee engine of 375 h.p. and one of 800 h.p. and in addition a new 300 h.p. radial engine is at the moment undergoing test.

The Isotta-Fraschini company has completed an engine of 340 h.p. known as type V.9. which has already undergone its first trials successfully, and a 12-cylinder Vee-engine of 500 h.p. is nearing completion.

The Colombo company has successfully tested a light-powered engine of 20 h.p. and has also under construction a 12-cylinder Vee of 450 h.p. which will be ready in March.

The Piaggio Co., one of the oldest engineering firms in Italy, which has quite recently taken up the construction of aircraft and aero-engines is completing an engine of 15 h.p. which is to be fitted into the dual-control light aeroplane at present under construction. In addition to light aeroplanes the firm is also building a single-seater scout of 300 h.p. and large flying boats to the design of Signor Bastianelli who was previously with the Pegna-Rossi-Bastianelli and the Construzione Navali-Aeronautiche firms.



THE TEST-PILOT'S DREAM.—This is not, as might be imagined, a figure from the recent report on The Disturbed Motion of an Aeroplane by Prof. Bryan, but is merely the artist's idea of the kind of nightmare that might be suffered by an overworked test-pilot following the after-dinner perusal of a new Air Ministry Specification for ship-carried aircraft.

Incidentally the artist wishes it to be known that he is perfectly aware that a considerable number of other movements might have been applied to this craft, and that their omission is due to a lack of time rather than to a lack of invention.

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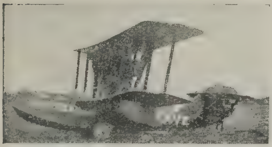

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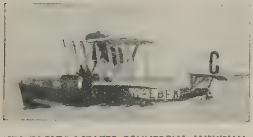
360 h.p. Rolls-Royce.



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The longest experience of FLYING BOAT building in this Country—11 years.
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Originators of the first Amphibian FLYING BOAT SCOUT in 1921.—This type of machine won the Schneider Cup, establishing world's records in 1922—163 M.P.H.

We produced the first English Commercial FLYING BOAT—1919.
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We were awarded the second prize of £4,000 in the Air Ministry's Competition for AMPHIBIANS, 1920, which was increased to £8,000 in recognition of the general excellence of design and construction of the Supermarine Amphibian Flying Boat. This was the only machine to accomplish all the tests and that had no breakages during the trials
We produced the first specially designed Deck-landing Flying Boat, 1921.
We hold the first official world's records granted by the F.A.I. for Marine Aircraft—duration of 1 hr., 34 mins., $51\frac{4}{5}$ secs. Longest distance accomplished 230 miles. Fastest time for 100 kilometres—62 miles, 28 mins., $41\frac{2}{5}$ secs. Fastest time for 200 kilometres—124 miles, 57 mins., $37\frac{3}{5}$ secs.—1922.

WINNER
of the International Race for the
SCHNEIDER CUP
NAPLES, AUGUST, 1922.

WE HAVE BEEN ENTRUSTED BY THE BRITISH AIR MINISTRY WITH THE DESIGN AND CONSTRUCTION OF THE LARGEST FLYING BOAT ORDERED BY THEM SINCE THE WAR.
ALSO WITH THE DESIGN AND CONSTRUCTION OF THE FIRST DOUBLE-ENGINED AMPHIBIAN FLYING BOAT TO BE ORDERED IN THE BRITISH EMPIRE.

"SEA LION II" SINGLE SEATER AMPHIBIAN.
450 h.p. Napier Lion. Winner of the International Race for the Schneider Cup at Naples, 1922.

"SEAGULL" AMPHIBIAN MACHINE.
450 h.p. Napier Lion.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 11; Tuesday, 10; Wednesday, 12; Thursday, 0; Friday, 0; Saturday, 9; Sunday, 3.

London—Paris—Zurich :
Handley Page Transport, Ltd., machines 9, passengers 29, freight — lbs.

London—Ostend—Cologne :
Instone Air Line, Ltd., machines 12, passengers 18, freight 10,254 lbs

London—Rotterdam—Hanover—Berlin :
Daimler Airway, machines 8, passengers 2.

Paris—London :
Air Union, machines 8, passengers 10, freight 7,491 lbs.

London—Rotterdam :
K.L.M., machines 8, passengers 7.

Special Machines : 0.

Total number of trips by British machines : 29, carrying 49 pas Foreign machines : 16, carrying 17 passengers.

Comparative Figures :

For week ending Jan. 20 :
Machines, 45; Passengers, 66; Crews, 70; Total personnel, 136

Corresponding week last year :
Machines, 36; Passengers, 79; Crews, 63; Total personnel, 142

Corresponding week, 1921 :
Machines, 14; passengers, 14; Crews, 21; Total personnel, 35

Corresponding week, 1920 :—
Machines, 15; Passengers, 12; Crews, 17; Total personnel, 29

Croydon Notes.

There was a slight increase last week in the number of passengers travelling on the air lines. Thursday and Friday were blank, but on other days the services ran regularly.

There is at present no apparent move forward on the part of the Imperial Air Transport Company and it is freely rumoured that another deadlock has been reached. Whether this deadlock is due to financial or personal reasons one does not profess to know.

Mr. Jerry Shaw who now controls the destinies of Shell Spirit so far as it is used in the realms of Civil Aviation has been on the sick list recently. It is feared that he caught a chill while spending his Christmas in beautifying the countryside by removing the Shell road signs and that this chill was aggravated by the exposed condition of the said countryside when the huge hoardings had gone.

On Monday of this week because of the railway strike all available space in the Continental machines was booked. The weather however was on the side of the strikers and the machines were unable to leave.

The Aircraft Disposal Company works are busy on a number of machines. The only one in the air last week was a Tinsyde which Mr. Perry tested on Saturday.

The Selfridge 50-Mile Gliding Competition.

Lieut.-Col. M. O. Darby, Vice-Chairman of the Racing Committee of the Royal Aero Club, and Lieut.-Commander H. E. Perrin, Secretary, representing the Royal Aero Club, recently interviewed Mr. H. Gordon Selfridge on the subject of the 1,000 Guinea Prize offered by Selfridge and Co. Ltd. As a result Mr. Gordon Selfridge has expressed his willingness to extend the date for a period not exceeding twelve months from Jan. 1, 1924.

It is just possible that the Royal Aero Club may decide to hold a Gliding Competition during this year and in that event the Prize will be open for such a competition, if not won in the meantime. Should the 50 miles not be flown, a consolation prize of 500 guineas will be awarded for a flight of not less than 25 miles to which will be added Twenty Pounds for every mile in excess of the 25 miles.

The Regulations remain the same and can be obtained from the Royal Aero Club, 3, Clifford Street, London, W.1.

R.A.F. Officers and the Royal Aero Club.

Following the recent decision of the Royal Aero Club to admit to membership serving officers of the Royal Air Force and the Royal Air Force Reserve at the reduced subscription of £2 2s. a large number of Officers have joined the Club.

This is an excellent move on the part of the Club, for its influence as the governing body of the sport of flying is greatly enhanced by adding to its membership those on whom the progress of Aviation chiefly depends at the moment.

PERSONAL NOTICES.

Deaths.

CLEVERLY.—On Jan. 15, at Isle of Grain, as the result of a flying accident, Sq. Ldr. Sidney Mechen Cleverly, R.A.F., Dept. of Supply and Research, Air Ministry.

[Sq. Ldr. Cleverly was a senior assistant to the Director of Research and had served during the War 1914-18 with the Independent Force, R.A.F. He was one of those who was responsible for the success of the Independent Force dinners since the War. He was equally liked in the Air Ministry and by those in the R.A.F. and in the Industry with whom he came in touch, and his earnest work in his official capacity made him a valuable servant of the King.—C. G. G.]

CURTIS.—On Jan. 15, at Isle of Grain, as the result of a flying accident, Flt. Lt. William Reginald Curtis, R.A.F.

[W. R. Curtis had recently been appointed to Isle of Grain after a tour of service at Malta. While in the Mediterranean he made many notable flights, particularly from Malta to Gibraltar and back. He was an equally good pilot of big flying boats and of float seaplanes.

His death, with Sq. Ldr. Cleverly, occurred in a Bristol Fighter. The engine failed as the machine was over the sheds at Grain, heading for Sheerness Harbour. To avoid going into the water Mr. Curtis tried to turn, and spun into the ground.

He was very popular with the R.A.F. at Malta, full of energy and initiative, and just the kind of young officer who would be of high value in a station where there was much to be done.

Just after the War, 1914-18, he distinguished himself by flying without a stop from London to Madrid on an Alliance biplane with a Napier engine, certainly one of the finest flights yet made.

To his young wife all will offer the most sincere sympathy.—C. G. G.]

NICHOLSON.—On Jan. 11, at St. Thomas' Hospital, of pneumonia, Flt Lt. Ernest William Nicholson, R.A.F.

[E. W. Nicholson had served for four years with No. 70 Squadron, R.A.F., first of all in Egypt and afterwards in Iraq. He was that remarkable combination a highly technical engineer and a skilful pilot of all types of aeroplanes. For some time past he had been flying as a pilot on the Cairo-Baghdad mail route using the twin-engined Vickers machines with which No. 70 Squadron is equipped. Not satisfied with the strenuous work of desert flying he devoted his technical ability to preparing a number of graphs of the performances of the various types of machines used in Iraq and one gathers that these have been of considerable value to the technical side of the Air Ministry.

Having completed his tour of service overseas he returned to England on leave and had been posted to Isle of Grain for experimental work when he was taken ill. The cause of his death was diabetes followed by pneumonia.

Apart from the respect in which he was held by everybody in the squadron on account of his ability as a pilot and technician E. W. Nicholson was exceedingly well liked for his personal charm and readiness to help anybody in any possible way. He was in fact precisely the type of officer who is most desirable in the Air Force and he is a very real loss to the King's Service.—C. G. G.]

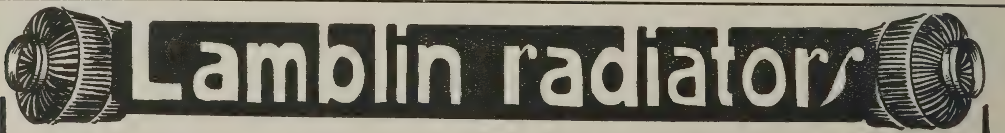
Marriages.

McCLOUGHRY—LEWIS.—On Jan. 16, at King's Weigh House Church, London, Edgar J. Kingston McCloughry, D.S.O., D.F.C., of Lee-on-Solent, to Freda Elizabeth Lewis, daughter of Sir Alfred and Lady Lewis, Coneybury, Lower Kingswood, Surrey.

SAUNDERS—MABBETT.—On Nov. 28, at Basrah, Flt. Lt. H. W. L. Saunders, M.C., D.F.C., M.M., 84, Sqdn., R.A.F. to Phyllis, only daughter of Major and Mrs Percy Mabbett, of Durban.

Birth.

WHITAKER.—On Jan. 14, at 28, Oakley Street, Chelsea, the wife of Flt. Lt. Raymond Whitaker, R.A.F.—a son.



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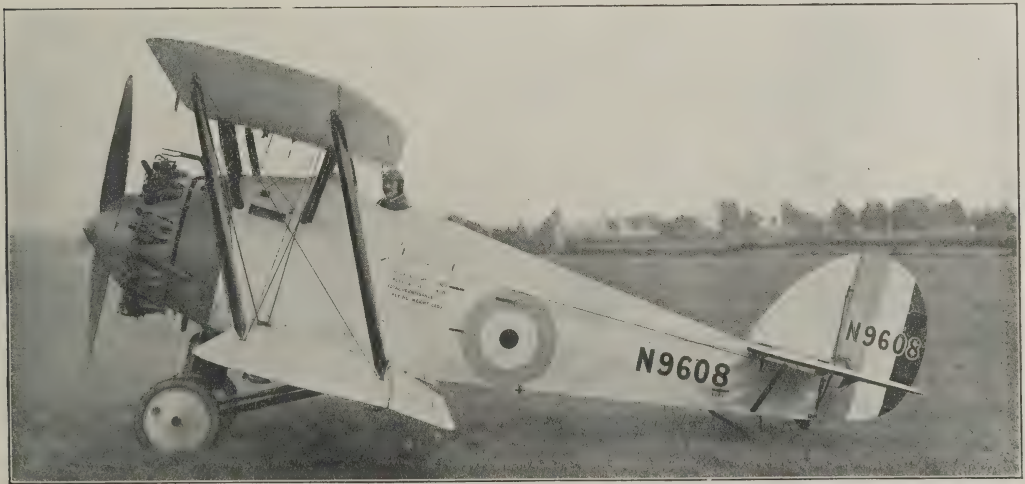

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THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXVI. No. 5. SIXPENCE WEEKLY. Registered at the G.P.O. as a Newspaper.

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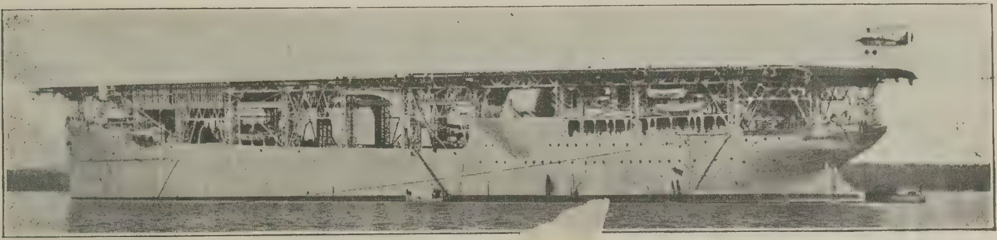

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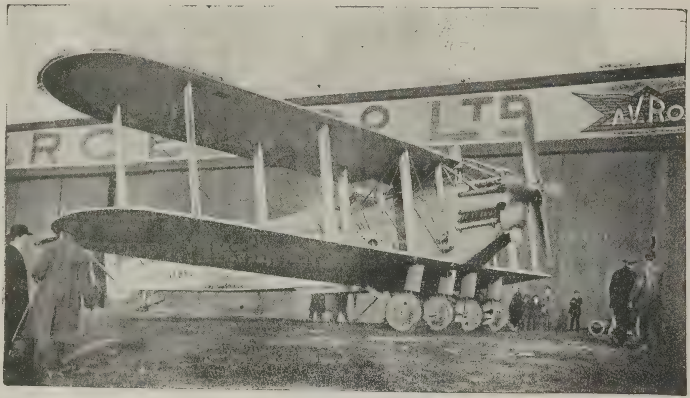

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ON OUR NEW AIR MINISTER.

It was announced on Jan. 23 that Mr. Ramsay MacDonald our new Prime Minister had appointed to be Secretary of State for Air Brig.-General C. B. Thomson, D.S.O., C.B.E.

General Thomson had quite a distinquished career in the Army before he became a politician. He joined the Royal Engineers in 1897 and served in the Mashonaland and South African campaigns. He passed through the Staff College at Camberley and was on the staff at the War Office from 1911 to 1914. On the outbreak of war he went to France on the staff of the First Army Corps under Sir Douglas Haig.

In 1915 he was chief of the British Mission to Roumania and later he visited Russia both before and after the Kerensky revolution. Thereafter he returned to active service and commanded the brigade of General Allenby's Army which was the first to enter Jerusalem. From May 1918 to July 1919 he was at Versailles as British Military Representative on the Supreme War Council.

Later he became Liberal Member of Parliament for Anglesey and then went over to the Labour Party. As such he was a member of the Labour Commission which visited Ireland in 1920 and issued such a damning report on outrages by the R.I.C. Auxiliaries and the Black-and-Tans. He was also a member of the Labour Commission to the Ruhr in 1923.

It will be very interesting to see how General Thomson develops as Air Minister. There is no doubt about his having brains for nobody can "get Sappers" from Woolwich unless he has brains. But the regular soldier of senior rank who becomes a Member of Parliament is automatically suspect in the matter of mentality and the turning of a Liberal M.P. into a Labour Member suggests perhaps an excess of heart over head, or alternatively the brain of a doctrinaire. His appointments to the various military commissions and to the Supreme War Council suggest that General Thomson may have a good deal of the "politician" in him, but at the same time the fact that he is entitled to write *p.s.c.* after his name gives one respect for his organising ability.

One makes these comments in a purely impersonal way and without any political bias of any sort and one hopes to be able to give the same whole-hearted support to our first Labour Air Minister as one has given in the past to our excellent Conservative Air Minister Sir Samuel Hoare and his Liberal predecessor Captain Guest. The worst thing about General Thomson seems to be that he is a soldier.

It is an axiom founded on the experiences of history that a soldier is almost the worst possible war minister, because of his liability to be identified with one or other school of military opinion. And as the post of Air Minister is so essentially of military importance it may well be that the same qualities which make a very good soldier a very bad war minister may make him a very bad air minister. At the same time one hopes and believes that he and his colleagues of the Government will do a great deal better than they are expected to do by their political opponents.

One feels it only right to use this opportunity of taking farewell of Sir Samuel Hoare. During his brief period of office he has done an immense amount of good. He has endeared himself personally to everybody concerned with aviation, official and unofficial alike, with whom he has come in contact. He has shown remarkable organising ability and he has shown great fixity of purpose in carrying through the Cabinet and through Parliament his various schemes for the betterment of the Air Force.

Perhaps his best quality of all has been his complete loyalty to his staff at the Air Ministry. He has never interfered with the duties of his staff and trusting in his subordinates as he has done his subordinates have in turn trusted him and have joyfully done their best work for him. It is only to be hoped that if and when a Conservative Government returns to office Sir Samuel Hoare may again become Air Minister.

All concerned with aviation will thank Sir Samuel Hoare and his gracious wife, the Lady Maud Hoare, for the high services they have done to aviation during the past year. Similarly thanks are due to the Duke of Sutherland for his excellent work as Under-Secretary for Air. And equally all will wish General Thomson success in his new office.—C. G. G.

ON IMPERIAL AIR TRANSPORT.

It was remarked in the Civil Aviation notes last week that something was holding up the formation of the Imperial Air Transport Company, Ltd., which is being financed in its initial stages by the British Foreign and Colonial Corporation and is to have the Government subsidy of a million pounds in the course of the next ten years. The suggestion was then made that some personal disagreement between the parties concerned was causing a deadlock in the formation of the new company. One is assured that this is not so because all the parties concerned are either in agreement or out of England and that the true reason for the delay has been the political situation.

The position is that the British Foreign and Colonial Corporation Ltd. has guaranteed the capital necessary for the working of the company but it is not the intention of the Syndicate to provide the whole of that money if the great British public does its duty and subscribes to the undertaking. Therefore the intention is to float the I.A.T. Co. Ltd. as an ordinary public company.

Whether the public will do so under the most favourable possible conditions is naturally a question involving a certain amount of doubt, for the public is not wildly interested as yet in air transport. But the public would be much less likely to come in while financial affairs are disturbed by the prospects of a Socialist Government even though that Government may have disclaimed any intention of imposing a levy on capital. Naturally therefore those concerned with the flotation have postponed offering the shares to the public until such time as there is some reasonable prospect of the public supporting the proposition.

It is to be hoped that when the shares are offered a reasonable number will be taken by the British public. But one is a trifle doubtful whether it will be so because the public has been told so very little about the air lines in general during the past year. And it has been told nothing whatever about the Imperial Air Transport Company as such since the days when the people concerned with its formation were chastising one another in print.

It is natural that during the latter part of the year the three operating companies should not have spent much money on advertising their doings. They had no security of tenure and therefore conserved such means as they had. It is to be hoped therefore that if and when the I.A.T. Co. Ltd. comes into being it will set to work to impress on the public that such a thing as air transport does exist.

On this point one of the most experienced of business men in the Aircraft Industry expressed himself very clearly in a recent letter. He said that there was no doubt that outside the people interested in aviation very few of the general public knew how the various lines were conducted or the means taken to ensure the safety of the passengers. It surely was worth while to educate the large number of travellers to the Continent as to the benefits of air travel. And yet since the air-ways had been running he did not remember a really sound publicity campaign to popularise flying.

In his opinion very few of the people who travelled first class to the Continent daily realised how many journeys a day were made by the air lines or in what comfort the passengers travelled or the time taken on the journey. Above all he said that they did not know how safe it was, and as far as he could see no attempt had ever been made to rub this in. There were many points which should be brought home to the general public such as the care taken in the overhaul of the engines and machines, the mileage flown without accident, and the precautions taken to ensure that each trip should be carried out in safety. Yet beyond casual mentions in the press no effort had been made to drive this home.

These arguments coming from a man of very considerable experience should be read, marked, learned and inwardly digested by those who hope to have the management of the Imperial Air Transport Company Ltd. when it actually becomes a working proposition.—C. G. G.

SINGAPORE AND THE OIL SUPPLY.—(Part III.)

By C. G. GREY.

The Existing Scheme of Defence.

A scheme already exists to safeguard our Persian supplies and to transport the oil more efficiently. It may be remembered that during the War 1914-18 the British Admiralty financed the Anglo-Persian Oil Company to the extent of several millions of pounds, so as to accelerate the development of the Persian supplies. In 1923 a proposal was made that the British Government should sell out to private capitalists the shares obtained in this financial deal. Whether this be done or not seems to matter little, for the Government, as represented by the permanent officials who are but little influenced by changes of political parties, are fully aware of the importance of Persian oil.

The scheme is to run a pipe-line from Basra on the Persian Gulf, which is where the existing pipe-lines from the oil-fields come down to the port of shipment, right across the Arabian Desert to the port of Jaffa in Palestine on the Mediterranean. Thus the oil produced in Persia will be pumped straight into the tank steamers in the Mediterranean where they will be fairly safe against attack either by Japanese or Muscovites.

The contracts for the construction of this colossal pipe-line have already been placed, and contracts have also been placed for the construction at Jaffa of an oil port on a scale comparable with Batoum and Baku and Sourabaya and the other great oil ports of the World. The chief contracts have been accepted by Lord Cowdray's firm, Pierson and Sons, Ltd. One gathers that though up to the end of 1923 no actual work had been done on the pipe-line or on the port, all the plans and drawings had been done and a great deal of material had been prepared ready to start work when the proper moment arrived.

Now it is evident that with that pipe-line in full working order Japanese raids into the Indian Ocean would not affect our oil supplies much, though they would interfere with our Indian trade. And unless we and our allies suffered utter defeat in the East Indies we should always be able to get convoys of troops and supplies through to Singapore and our other fighting bases. But until the pipe-line operates it is of vital importance to protect the route of the oil-tank steamers from the Persian Gulf to the Red Sea against torpedoes from submarines or aircraft. Therefore we must rely on the Singapore base to keep Japanese raiders from ever getting loose into the Indian Ocean.

Control without Occupation.

And here comes in the true reason for our control of Iraq and Palestine, which underlies all our philanthropy to King Feisul and the Arabs of Iraq and the Emir Abdullah of Trans-Jordania and our friends the Zionists.—If the pipe-line from Basra to Jaffa is to fulfil its object it and its oil-fields must be assured of uninterrupted operation. We must be quite sure that no Muscovite raiders from Turkestan or the Kurdish Hills can reach and damage the oil wells in Persia. And we must be equally sure that no desert Arabs damage the pipe-line. We cannot hope to occupy the whole of Persia and Arabia and Palestine with troops. But we can and do control all three.

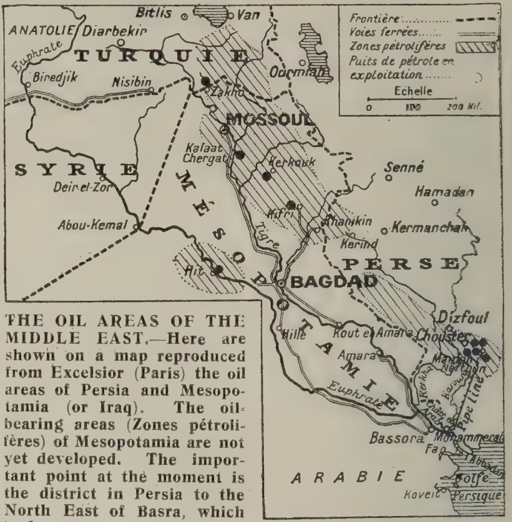
Sir Samuel Hoare, the highly efficient Air Minister in Mr. Baldwin's Cabinet enunciated the theory of "Control without Occupation" by means of air power. The Royal Air Force in Iraq under Air Marshal Sir John Salmond demonstrated that such control is possible. The Kurds to the North of Baghdad and the East of Mosul have already been taught that they must not raid our territory (or rather King Feisul's) and the desert Arabs have been taught that they must not raid our friendly tribes (or rather the Emir Abdullah's). And that is all part of the lesson that nobody must interfere with the oil-fields in Persia or with the pipe-line across the desert.

We hold Mosul because it blocks the road to any advance from Turkey down the Tigris to Baghdad. Aircraft operating from Mosul can block the roads from the Lake Van country, Erzeroum and the Black Sea port of Trebizond and the Turkish rail-head at Nisibin. Aircraft operating from Baghdad and the subsidiary station at Ramadieh can block the roads down the Euphrates from Aleppo and from the Turkish railway through the Taurus mountains. Aircraft operating from Aman and the Air Force Stations in Palestine can block the roads towards Jaffa, and these can be helped by aircraft flying from carriers in the Mediterranean.

Other aircraft from the main base at Baghdad can block the roads from Kurdistan eastward into Persia by Tabriz or Hamadan or Kermanshah, and so can protect the oil-fields in Persia from any attack from the West. Thus we can keep the Turks from interfering with either the pipe-line or the oil-wells

Iraq Oil.

Even if we lost Mosul in a sudden Turkish attack because of lack of reinforcing aircraft from the South we could still keep all the roads blocked so long as we had sufficient air force in Baghdad itself. But here another point arises.



THE OIL AREAS OF THE MIDDLE EAST.—Here are shown on a map reproduced from Excelsior (Paris) the oil areas of Persia and Mesopotamia (or Iraq). The oil-bearing areas (Zones pétrolifères) of Mesopotamia are not yet developed. The important point at the moment is the district in Persia to the North East of Basra, which is the present source of supply of the Anglo-Persian Company.

According to French authorities there are big oil supplies untapped around Mosul itself and between Mosul and Baghdad. These supplies would be a valuable addition to the Persian sources, and if the Great War be postponed long enough (say for another ten years) it is probable that we shall be drawing oil from the Mosul-Baghdad area and piping it across the desert along a new line to Jaffa, a long way North of the Basra-Jaffa line and considerably shorter. If we are to develop and protect this Iraq oil it will be necessary at all costs to hold Mosul as well as Baghdad.

The accompanying map is taken with thanks from the Paris *Excelsior,* where it appeared late in 1923 in an article under the heading—"L'Angleterre nous offre un exemple admirable de ce qu'il est possible d'obtenir par une intelligente co-opération entre les hommes d'Etat and les hommes d'affaires."

The article begins:—"It is very difficult for the great public to follow in its details the 'International politics of oil.' The struggle between the great trusts pursues itself most often in the shadows and only reveals itself to the public at rare intervals."—It is precisely for this reason that The Aeroplane is devoting to oil space which some people might think should be devoted to aircraft. But as aircraft are dependent on oil supplies it is well that all concerned with aircraft should know as much as may be about the "International politics of oil."

According to the *Excelsior* two important events had just taken place at the end of 1923:

(A) The English Government had made over its (or the Admiralty's) shares in the Anglo-Persian Oil Company to the Royal Dutch Company—which means that the Mexican-Shell interests and the Dutch East Indian interests and the Anglo-Persian interests are now all combined. Which is where the East Indies and Singapore come into direct contact with Persian and Iraqui oil interests.

(B) In France "L'Union Nationale des Pétroles" had been formed. This was intended to group all the French oil interests, and was formed on the initiative of the President of the Council. The idea is to participate collectively in the Mesopotamian (or Iraqui) oil supplies, 25 per cent. of which were reserved to France at the San Remo Conference in 1922, the balance going as 50 per cent. to the Anglo-Persian Co. and 25 per cent. to the Royal Dutch Co. By amalgamating the Royal Dutch, Shell and Anglo-Persian interests Great Britain gets 75 per cent. into one group leaving France with only 25 per cent. Hence the national union to protect French interests, lest *Perfide Albion* should collar the lot.

The article concludes:—"There is no oil in England: there is no oil in the English colonies; and yet in time of war as in time of peace England can consider as perfectly assured the supply of oil for her Navy and her aviation. Can we say as much?"—which confirms the remark made earlier in this piece that the French and Italian fighting services will have to be supplied with oil from our Persian supplies.

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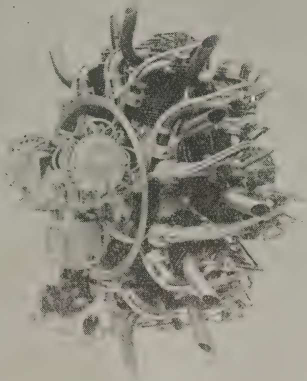


The "JAGUAR"

350 h p. 14 cyl. Air-cooled.

THIS engine represents the highest point yet reached in the development of the air-cooled aero engine. The design has been the subject of searching tests, both on the brake and in flight.

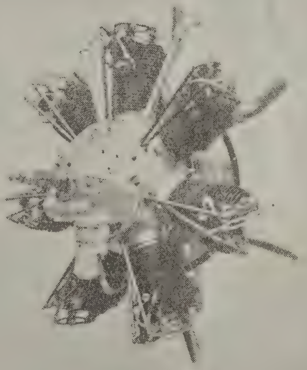
The following is the guaranteed minimum performance :—

At normal speed 1,600 r p m., 350 b.h.p.
Petrol Consumption, ·55 p s./b h.p.
·312 Litres per b.h.p. hour.
Oil Consumption, ·03 pts./b.h.p.
·017 Litres per b.h.p. hour.
Weight, complete :
760 lbs., 346 kgs.

The "LYNX"

180 h.p. 7 cyl. Air-cooled.

THE "Lynx" is an ideal engine for Training Aircraft. It is most accessible — being superior in this respect to any other aircraft engine.
Fuel consumption is very low and construction very simple.



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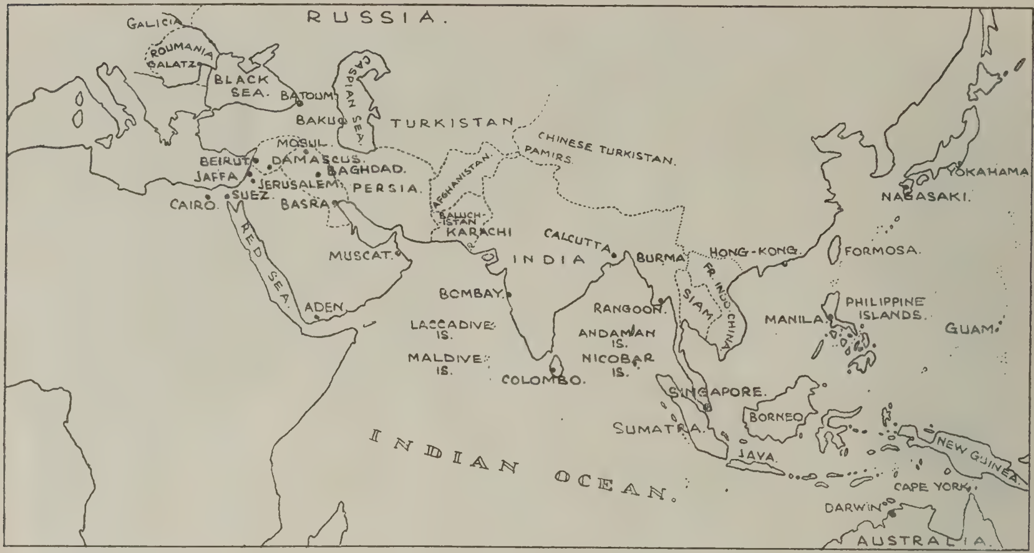

THE STRATEGY OF SINGAPORE.—A map showing the chief localities affected by the Singapore base.

It will be noticed that the San Remo Conference (in which it may be remembered delegates from the Union of Soviet Republics—otherwise the Bolshevik Government—took part) allocated the supplies of Iraqui oil without much reference to King Feisul or the people of Iraq. It is evident that the Iraquis could not operate the oil fields themselves and that the only way they can get any good out of them is to lease them to European firms.

Also it is evident that the Iraquis could not protect the oil-fields leased to European firms against attacks by the Turks from Anatolia or by the Muscovites from the Caucasus, or even against mere Kurdish raiders, though one hears that the Arab and Assyrian levies make good soldiers under British officers. Therefore it is essential that European forces should be available on the spot sufficient to assure the safety of these oil-fields as well as merely to stop an advance by Turkey or Russia on Mosul itself or Baghdad. And that is why the Royal Air Force must not only remain at Baghdad and Mosul but must be heavily reinforced in the near future.

French Interests.

Unfortunately it is as yet too early to know what the French intend to do about their 25 per cent of Mesopotamian oil. They might take possession of actual oil areas between Mosul and Baghdad and run their own oil wells. In that case they would probably run a pipe-line across the Syrian desert to Beirut, the Syrian port on the Mediterranean. Such an undertaking would be easy to the nation which built the Suez Canal and nearly built the Panama Canal.

But such a pipe-line would be so near Turkish territory to the North that it would be very difficult to protect against sudden raids from Nisibin or Biredjik—unlike our Basra (Bassora)-Jaffa line which is so far South as to be safe against anything except little raids by odd desert tribes, who can be easily controlled by aircraft patrols from Basra and Palestine. A pipe-line across Syria might well mean for the French "occupation without control"—to invert Sir Samuel Hoare's historic phrase. And the French are so astonishingly unpopular in Syria itself that they will always have far more trouble in controlling their native subjects than we have in Iraq and Palestine—which is the case in all French colonies—and so their line would always be liable to damage by local malcontents Therefore the operation of French oil wells in Iraq by the French does not seem a tempting proposition.

It is possible however that the French "Union Nationale des Pétroles" may hand over the development of all Iraqui oil to the Shell—Royal Dutch—Anglo-Persian combine and be content with an arrangement to stand 25 per cent. of the cost of development and take 25 per cent. of the profits, plus a guarantee that the French Government shall have 25 per cent. of the output in case of war. On the other hand it is equally possible that the French may go on talking about their intentions in Iraq till the Great War begins, by which time the British interests may have their oil wells working even though the desert pipe-line may not be finished. Then presumably as a war-emergency measure we shall have to finish the pipe-line at vast expense and take over also the working of the French oil areas.

And until the pipe-lines across the Arabian desert to Jaffa and possibly across the Syrian desert to Beirut are finished all the Mesopotamian oil like all the Persian oil will still have to go down the Persian Gulf and round to the Red Sea by tank steamers. And on their way those steamers will be liable to attack by Japanese submarines and aircraft unless we and the Dutch and Americans working from our Singapore Base can prevent the Japanese from penetrating into the Indian Ocean.

(To be continued.)

The Under-Secretary for Air.

Mr. William Leach has been appointed Under-Secretary of State for Air. He was born in 1870 and is a Bradford worsted manufacturer. He has been a member of the Independent Labour Party since 1895 and was Editor of the *Bradford Pioneer*. He is an Alderman of the City of Bradford and was at one time Chairman of the Finance Committee of the City Council. He was returned as Member of Parliament for Bradford in 1922.

The Air Minister's Private Secretaries.

The Air Ministry announces that the Secretary of State for Air (the Rt. Hon. C. B. Thomson) has appointed Mr. C. Ll. Bullock to be his Principal Private Secretary.

The Under-Secretary of State for Air (Mr. William Leach, M.P.) has appointed Mr. P. J. Oldfield to be his Private Secretary.

International Air Transport.

Arrangements for Air Lines running in conjunction throughout Europe during the coming year were agreed to at a Conference of the International Air Traffic Association held at the Hague during the past week. Representatives of eight European nations were present, the British representative being Major Woods-Humphrey, general manager of Daimler Hire Ltd.

Honorary Members of the R.Ae.C.

The following Temporary Honorary Members of the Royal Aero Club were re-elected for the year 1924 on Jan. 16:—U.S.A.: Capt. C. L. Hussey, U.S.N., Commander J. H. Towers, U.S.N., Commander J. C. Hunsaker, U.S.N., Major H. C. Davidson. France: Commander L. Sablé. Switzerland: H. F. Martin. Italy: Capt. S. Scaroni. Belgium: Capt. W. Coppens.

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THE ability to make point to point journeys regardless of the alternatives of taking off or alighting on land or on water is the chief characteristic of the Vickers-"VIKING"-Amphibian. A series of flights from the heart of London to the heart of Paris (Thames to Seine) showed a saving of over 1¼ hours on the ordinary route with its terminal road connections at either end.

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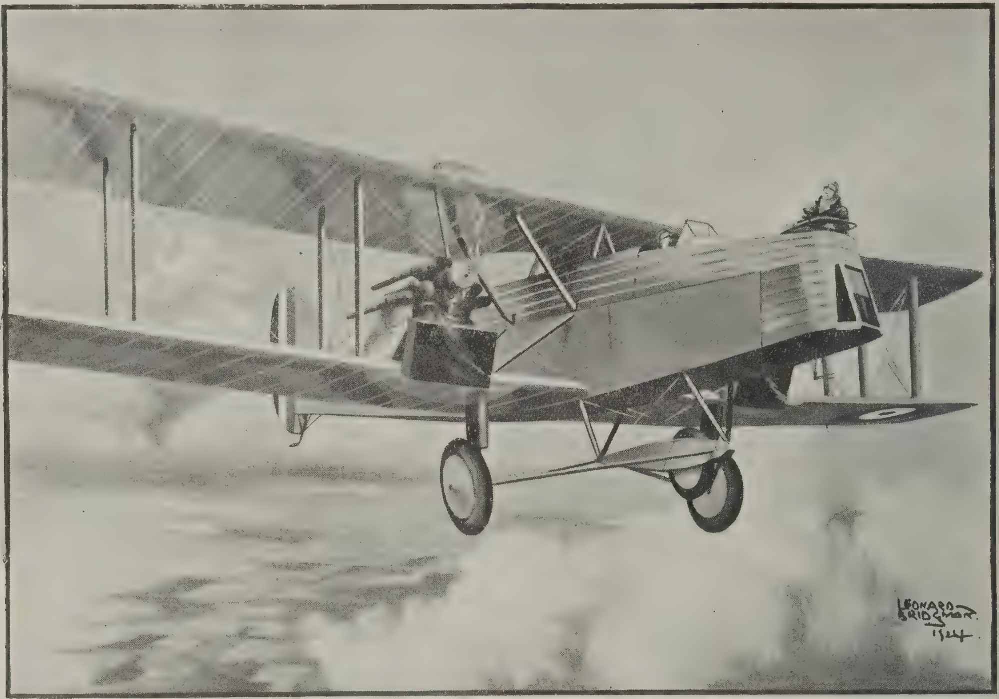

Leonard Bridgman 1924.

AN ALL-METAL BOMBER.—A drawing by Mr. Leonard Bridgman of the Boulton and Paul Bolton with two 450 h.p. Napier Lion engines. This is one of the latest all-metal bombers built for the R.A.F.

The Senior Services and the Air Force.

The report of the Sub-Committee of the Committee of National and Imperial Defence appointed in Mar. 1923 to inquire into the question of national and imperial defence has now been published as Command Paper 2029 and can be obtained price sixpence net from His Majesty's Stationery Office, Kingsway, W.C.2., or from booksellers.

This is the report of a Sub-Committee composed as follows:—The Marquess of Salisbury (in the Chair), The Chancellor of the Exchequer, the Secretary of State for Foreign Affairs, the Secretary of State for the Colonies, the Secretary of State for War, the Secretary of State for India, the Secretary of State for Air, the First Lord of the Admiralty, Lord Balfour, Lord Weir and Sir Maurice Hankey (Secretary).

Its terms of reference were to inquire into the co-operation and correlation between the Navy, Army and Air Force from the point of view of National and Imperial Defence generally, including the question of establishing some co-ordinating authority, whether by a Ministry of Defence or otherwise, and, in particular, to deal with: (a) The relations of the Navy and Air Force, as regards the control of Fleet air work; (b) The corresponding relation between the Army and the Air Force, and (c) The standard to be aimed at for defining the strength of the Air Force for purposes of Home and Imperial Defence.

The consideration of the relations of the Navy and Air Force as regards the control of Fleet air work was remitted to a special Sub-Committee composed of the Lords Balfour, Peel and Weir. The evidences of the Chiefs of Staff of the three Services was heard at great length and the special Sub-Committee heard sixteen other witnesses. Memoranda on the question of a Ministry of Defence were received from Lord Midleton, Lord Haldane, Major-General Seely, Sir Eric Geddes, Field-Marshal Sir William Robertson, Lieut.-General Sir Aylmer Hunter-Weston, Major-General Sir J. H. Davidson and Major-General Sir Frederick Sykes. In addition the Committee derived useful information from a report called for by the special Sub-Committee from Lieut.-General Sir Charles Harington, General Officer Commanding-in-Chief, Allied Forces in Occupation in Turkey.

Those who are interested in the subject of the co-ordination and co-operation of the Fighting Services should obtain the paper and study it in detail.

So far as the relations between the Air Force and the Navy are concerned the recommendations of the special Sub-Committee have already been fully reported and discussed in The Aeroplane of Aug. 8, just after that section of the report which is dated July 21 1923 was published. Since then nothing has occurred to alter one's views on the subject of the Fleet Air Arm. In fact what one has heard since then concerning the attitude of the Navy towards the Air Force tends to confirm one's views as then expressed.

Apart from this report of the special Sub-Committee the rest of the main report amounts to an expression of opinion that a Ministry of Defence is undesirable and impracticable, either by making the heads of the three fighting Services subordinate to a Ministry of Defence or by an amalgamation of the three Service departments.

The existing system of departmental initiative will continue and the responsibility for wider initiative directing the common action of the three or any two of the three Services will rest with the Chairman of the Committee of Imperial Defence acting under the general direction of the Committee of Imperial Defence and with the assistance of the three Chiefs of Staff of the fighting Services.

Beardmore Redivivus.

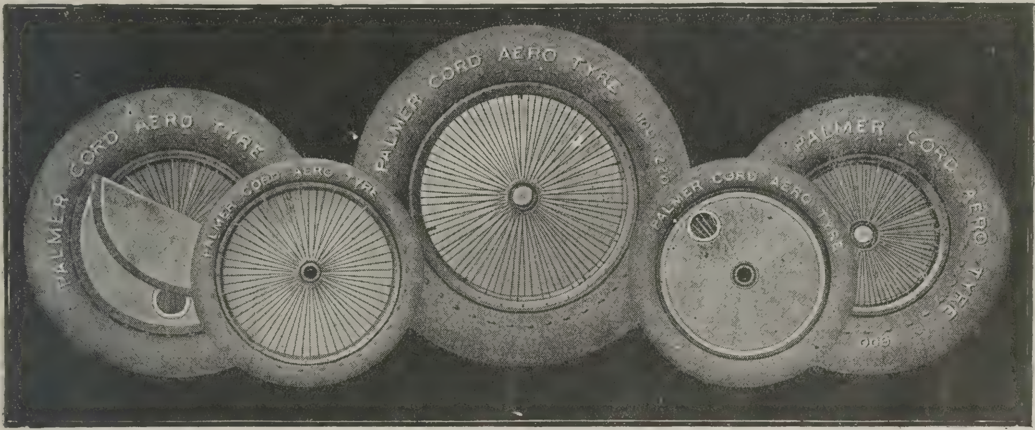
It will be remembered that after the Air Ministry competition for civil aeroplanes in 1920 the famous firm of William Beardmore and Son Ltd. of Dalmuir practically closed their aircraft department. That department is now being re-opened and will be primarily under the control of Mr. Campbell who managed it during the War 1914-18. It is now known that Mr. Campbell has engaged as chief designer Mr. W. S. Shackleton who designed the A.N.E.C. light aeroplanes which did so well at Lympne. Mr. Shackleton was, until he designed the A.N.E.C., at the Blériot Works near Paris, where he was in close touch with M. Herbemont, the designer of the Spads, and with M. Kirste who is now producing new Blériot types and was during the War responsible for the Austrian Phönix biplanes.

Evidently Beardmores intend to build light aeroplanes, for one hears of inquiries from that firm to makers of various types of 1,100 c.c. engines. But one imagines that their chief intention is the manufacture of war machines, if the Kirste-Herbemont, Spad-Blériot, influence has made itself felt on Mr. Shackleton.

Also one hears that Beardmores have been considering the question of acquiring the British rights for the designs of Dr. Rohrbach, who designed the famous four-engined Zeppelin-Staaken cantilever monoplane, the vast passenger-carrier which after flying a few tests was destroyed by order of the Commission Aéronautique Inter-Alliée which devoted itself so assiduously to ruining German aviation. Dr. Rohr-

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
"	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
"	138	130.	38.09	Central
575×60	21	160.	28.	Central
"	34	150.	31.75	104/46
"	111	150.	38.09	104/46
600×75	21	160.	28.	Central
"	34	150.	31.75	104/46
"	111	150.	38.09	104/46
700×75	78	178.	44.45	132 46
"	79	178.	44.45	Central
"	100	178.	38 09	132 46
"	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	96	178.	55.	132/46
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	96	178.	55.	132/46
"	99	178.	38.89	132 46
"	112	150.	38.09	Central
800×150	82*	185.	55.	135/50
"	85*	185.	55.	Central
"	36*	185.	55.	135/50
"	40	185.	60.32	135/50
"	152	185.	66.67	135/50
"	163	185.	66.67	135/50
1000×150	131	220.	66.67	Central
"	102	185.	55.	125/60
"	141	250.	80.	Central
"	201	185.	60.32	125/60

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	209	185.	55.	Central
"	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
900×200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 36, 40 and 163 are of stronger type than the other wheels for 800 × 150 tyres.*

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U/N/NN.

bach has since built in Denmark a very successful all-metal twin-engined monoplane flying boat. Whether Beardmore intentions are in the direction of flying-boats or of giant land machines one cannot say.

A further rumour has it that the Beardmore semi-Diesel heavy-oil engine is expected shortly to be in the air and is actually being installed in the D.H.27 (the Derby bomber). The preliminary experiments with a single-cylinder unit are believed to have been quite successful and it is said that the complete six-cylinder job has been running well on the bench. If this engine turns out to be satisfactory it will mark a big step forward in Civil Aviation, as the heavy-oil engine is the best possible insurance against petrol fires.

The Howden Air Station.

The Airship station at Howden, East Yorkshire, has been purchased by Douglas, Hollis and Co. Ltd. of London and it is shortly to be demolished. All the buildings and machinery on the site are to be sold by public auction and private treaty. The principal buildings comprise one airship shed 750 ft. long and 170 ft. high and 350 ft. wide, another shed 700 ft. long, 230 ft. wide, and 120 ft. high, and two smaller sheds 325 ft. long by 170 ft. wide and 100 ft. high.

The work of demolition will take at least a year and will create employment for several hundred men.

A Three-Cylinder Light Aeroplane Engine.

One learns that Burney and Blackburne Ltd. of Bookham, the makers of the Blackburne motor-cycle engines which did so well in the Light Aeroplane Competition at Lympne in October, have in course of construction a three-cylinder radial engine of 1,100 c.c. specially designed for this year's two-seater Competition. Such an engine should do quite good business, for both pilots and designers want something with more than two cylinders, because one defective cylinder of two means losing much more than half the power of the engine.

An Irish Fatal Accident.

On Jan. 23 Lieut. R. T. Nevin of the Irish Free State Air Force, while carrying out a practice flight on a Bristol Fighter from Baldonnel aerodrome, crashed near Lucan. Lieut. Nevin was able to speak when the ambulance reached him but he was suffering from severe internal injuries from which he died in a Dublin hospital on the following day.

This fatal accident is the second which has occurred in the Free State Air Force since its establishment over a year ago.

Notes from Australia.

It is rumoured that the Civil Control Department has ordered two D.H.53 light aeroplanes. Presumably these are for experimental purposes and not for cross-country flying over the Australian bush. At the same time something of the sort with say the Bristol Cherub engine or the new 1,100 c.c. Blackburne might be quite useful for scouting over sheep and cattle runs.

There is also a rumour that an ultimatum has been issued to the Larkin Company intimating that they must get their air line going by a specified date or resign the concession.

It is said that Mr. Sidney Cotton, who is by birth an Australian, is negotiating with the Australian Government for an air line concession and that if he gets it he proposes to start running it with the machines which he has been using in Newfoundland, prior to equipping it with the most up-to-date British machines available.

The Shaw Ross Company have got a job renovating some of the D.H.9s of the Royal Australian Air Force, and it is said that they are making a very good job of it. Capt. Shaw's critical faculty has here a chance of justifying itself in execution. The same Company has also been doing a considerable amount of photographic work and there are possibilities of considerable expansion in that direction. During the past few months the weather has been unusually bad in the Melbourne district and consequently there has not been much photographic work done.

The firm's two remaining Sports Farmans are still going strong and the experts, who know all about everything and apparently have no desire to know anything which is not known already, sit back and watch them perform and retire murmuring that " there is no such animal," or words to that effect. These machines fitted with an engine of alleged 60 h.p. which gives about 40 h.p. are quite surprising as practical sporting machines. One of these rotary engines has done about 250 hours and is still going strong.

The West Australian Air Line people have just got an extension to their route, a matter of about a thousand miles extra. Major Brearley is to be congratulated on the wonderful results that he has been getting out of his machines which daily fly hundreds of miles over country where there is no possible chance of landing and practically no possible chance of rescue in case of a forced descent. As a matter of fact the West Australian Airways are probably one of the two or three best-run air lines in the World.

The Royal Australian Air Force does not seem to be making the progress which it might have done. The individual officers and men are very good indeed and quite efficient but as a whole the R.A.A.F. lacks Government support.

Mr. E. J. Hart who made such a plucky attempt to supply Australia with an aeronautical paper in that excellent publication *Aircraft* had to close it down some time ago and has recently been employed in charge of the Information Department of the Department of Civil Aviation where he has been doing his best to keep aviation from being forgotten altogether in Australia.

Aerial Mapping in Canada.

During the season just closed a number of experiments have been carried out in the use of aircraft for supplementing the work of parties employed by the Topographical Survey in Western and North-Western Canada. These experiments were conducted by the Canadian Royal Air Force under the direction of Mr. A. M. Narraway, Controller of Surveys, and consisted of taking a series of vertical and oblique photographs from aircraft flying at pre-determined heights. The photographs were used as an aid in plotting topographical features on the map.

Operations were first conducted in the area north of Pas, Manitoba, where reliable maps are required to facilitate the development of the mineral and forest resources in which the district is known to abound, and where owing to the nature of the country ordinary survey methods have been hitherto restricted to the limits of the main connected waterways.

After a land survey party had been sent into this area in the Spring a seaplane manned by the pilot, an engineer and a photographer followed later in the season.

The seaplane following the course made by the land party took oblique photographs from a constant height of 4,000 feet at intervals of every three miles so that each picture showed in the foreground the terrain shown in the background of the previous one. In addition to these photographs, which were taken directly ahead, a further series were taken in a systematic manner at right angles to the line of flight. By this means photographs were obtained of a strip of country stretching for over five miles on each side of the line.

When the photographs were developed they were divided up by a grid system and the mass of topographical features revealed by the photographs was plotted on the bare plans prepared by the ground survey.

Upwards of 700 photographs were obtained and these are now being plotted on the maps, which when completed will be the most complete ever issued of any district in the north of Canada.

The next series of experiments was carried out in the settled areas in the vicinity of Red Deer and Edmonton, Alberta. A further series of experiments was carried out in the Edmonton district in conjunction with the surveys for the classification of lands for settlement. This work requires the use of accurate maps showing the roads and trails areas covered by bush, swamps, hay meadows, and other natural features.

These experiments indicate great possibilities and the results show that it is possible to go into an area previously unmapped and by means of aerial photography and a comparatively small amount of ground work to map even the most intricate waterways.

Aerial Survey in Burma.

Mr. A. A. Anderson, probably better known to readers of this paper as " Jock " Anderson, who for the past two years has been with the Surrey Flying Services at Croydon, is now in Burma as engineer to Mr. Ronald Kemp's aerial survey concern.

At present the staff is engaged in the erection of two D.H.9s and is converting these to seaplanes. Headquarters are at Monkey Point, Rangoon, which is the depot of the Royal Engineers.

One large shed capable of housing four machines has been erected and also a slipway down to the river Irrawaddy.

Appropriations for U.S.A. Aircraft.

Air appropriations included in the budget for the fiscal year ending June 30, 1925, are slightly in excess over recommendations for the fiscal year ending June 30, 1924, but in each case are not truly indicative of the very favourable outlook.

Following the Lassiter Board's Report, based upon investigations made by Assistant Secretary of War Davis and his predecessor, Col. Wainwright, now Congressman-elect, the War Department acted upon the Board's recommendation that a ten-year programme providing for 25,000,000 dols. a year be set up for the Air Service.

At the same time, the Navy Department has prepared a

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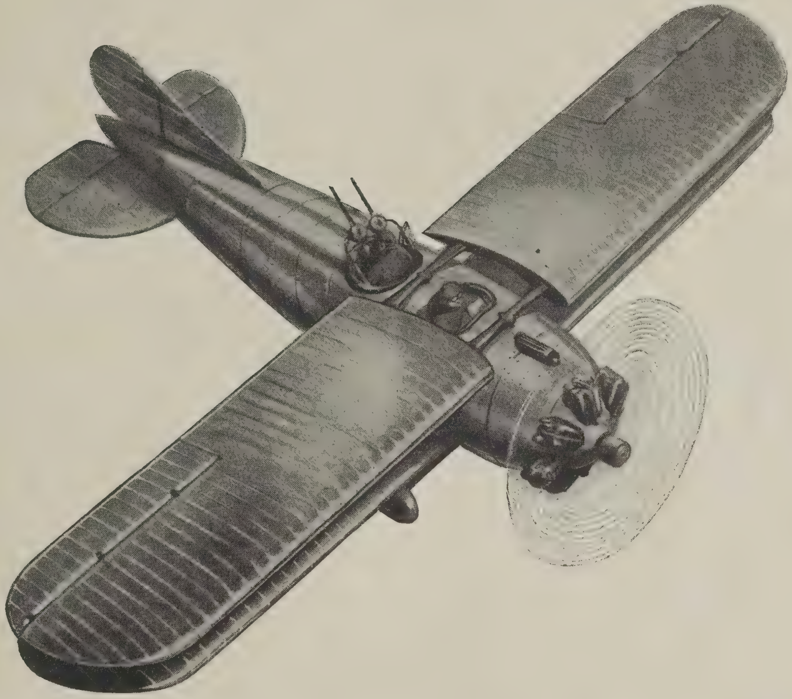

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

SHORT BROS.

(ROCHESTER & BEDFORD) LTD,

WHITEHALL HOUSE, 29-30, CHARING CROSS, LONDON, S.W.1.

five-year development programme. The situation is set forth in a dispatch to the *New York Herald*, dated Dec. 12 :—

> The War and Navy Departments are preparing to launch a joint assault on the Bureau of the Budget to obtain modification of the allowances made for the air services of the Army and Navy.
>
> It is purposed to put the Air Service on a definite basis covering years and calling for definite allowances annually to carry out the programme. A probable ten year period will be selected and full provision embodies as to material and personnel, so that the country will know ahead its air strength at any one point, in the period covered by the programme.
>
> Much more serious than the need for replacement of obsolete material is the question of putting the country on a producing basis. At the moment factory conditions are regarded as deplorable for the reason that their maintenance has depended on Government orders which were not forthcoming because of the lack of appropriations and there were no commercial contracts of importance.
>
> At the basis of any workable scheme the board believes is the factor of industrial mobilisation. This can only be accomplished by giving the factories a definite programme to work on from year to year. To accomplish this the army and navy figure on 25,000,000 dols. apiece. This total of 50,000,000 dols. will not be given, but a drive to secure 40,000,000 dols. is thought certain, particularly in view of the stress placed by President Coolidge on the importance of the Air Service in the scheme of the national defence.

A D.H.4 Altitude Flight.

On Dec. 13, Lieut. H. Harris with Mr. Morse, an American supercharger expert, as passenger reach an indicated height of 29,400 feet (corrected height 27,000 feet) on a D.H.4. from McCook Field, Dayton, Ohio.

The D.H.4. which was a perfectly standard U.S. Army machine was fitted with a 400 h.p. Liberty engine and a new side-type supercharger specially developed for the engine. For this flight the machine had new steel engine mountings and an underslung radiator.

The duration of the flight was 43 3/10 minutes, the descent taking 14 9/10 minutes. The lowest temperature encountered was 29 degrees below zero Altogether a very fine flight for a D.H.4. of war-time vintage.

The Paris Air Terminal.

It is proposed by M. Henri Sellier, Councillor-General of the Seine, to remove the Paris Terminal Aerodrome from Le Bourgêt to Mont Valerien. The scheme has been adopted in principle but ways and means have yet to be found.

Mont Valerien is an old fortress to the west of Paris overlooking the Bois de Boulogne. It is five miles from the centre of the city instead of seven as is Le Bourgêt and the drive into Paris from Mont Valerien is through the Bois instead of the squalid St. Denis area which has to be passed when coming from Le Bourgêt.

Paris to New York by Air.

A non-stop flight from Paris to New York is to be attempted this summer. A monoplane designed by M. de Monge for the purpose will shortly be tested. At its deepest part the wing of the machine will measure seven feet and here will be accommodated the pilot, crew and petrol supply.

The engines will be three 400 h.p. Lorraines and the speed is expected to be about 120 m.p.h. As a preliminary test a non-stop flight will be made from Paris to Cairo a distance of about 1,500 miles.

The Dixmude.

The report of the Commission appointed to inquire into the loss of the *Dixmude* has been handed to the Minister of Marine. The report shows, as might have been expected, that no definite conclusion was reached, but the Commission inclined to the belief that the ship was struck by lightning and fell into the sea from a height of 4,500 to 6,000 ft. How this conclusion as to height was reached is not stated.

An Italian Commission in Paris.

On Jan. 8, Commendatore S. E. Mercanti, director of Italian Civil Aviation visited Le Bourget aerodrome. He was accompanied by a number of Italian pilots including Commandant Bernardi, Officer Commanding the Italian experimental and test squadron, Commandants Bernasconi and Ranza, single-seater squadron commanders, and Capt. Biondi of the Italian technical service.

After demonstrations by M. Doret on the latest Dewoitine single-seater fighter, Commandants Bernardi, Bernasconi and Ranza each flew the machine in turn.

From which one may gather that the Italians are seeking information, and that a certain French firm is indulging in practical propaganda, both of which are likely to be beneficial to the parties concerned.

Aeronautical Construction in Belgium.

Up to a few years ago Belgium relied solely on foreign constructors for the supply of aircraft. The Belgian Air Service still uses British and French aircraft, but whereas these have hitherto been purchased abroad they are now being constructed under licence in Belgium and judging from the number of small firms that are opening up it would seem that it is only a question of time when the Belgian Aircraft Industry will support the Belgian Air Service.

The biggest constructional firm in Belgium is the S.A.B.C.A. (Société Anonyme Belge de Construction Aéronautique). The works at Brussels cover an area of 18,000 square metres and employ a staff of 89 managers, technicians and designers, 13 foremen and 403 workers.

Under the direction of M. Demonthy, the S.A.B.C.A. produced during 1922, 43 complete aeroplanes, repaired 36 aeroplanes and 204 engines and constructed two spherical balloons. The S.A.B.C.A. has a yearly minimum contract of 6,000,000 francs with the Belgian Government and during 1923 they built 30 Nieuport-Delage type, 29 single-seater scouts, 15 Ansaldo type A., 300 two-seater reconnaissance machines and 24 Avro 504 K training machines in excess of the annual contract.

They also build De Havilland and Handley Page machines under license and they are at the moment building four W8es. (two Siddeley Pumas and one Rolls-Royce) for service in the Belgian Congo.

Two engineers of the S.A.B.C.A. MM. Jullien and Poncelet have designed and built light aeroplanes with success.

M. J. Stampe and M. Vertongen have established a small factory and school at Anvers and are building two types of training machines, one fitted with the 90 h.p. Anzani and the other with an 180 h.p. Hispano-Suiza, both of which have passed successfully official tests by the Belgian Government.

The Gosselies Aviation School at Charleroi under Commandant Russchaert's direction is building a semi-cantilever two-seater monoplane fitted with either a 45 h.p. or a 70 h.p. Anzani for sporting or dual-control training purposes.

The Zeebrugge Aero Works under Commandant Jacquet's direction is building an all-metal two-seater side-by-side monoplane. It is a "duck-wing" machine with enclosed cabin having accommodation for an extra passenger or light luggage. This touring or light commercial machine will be fitted with an engine of 70/80 h.p. and will be easily transformed into a seaplane by fitting duralumin floats in place of the ordinary undercarriage.

M. Cambrier has constructed a light aeroplane fitted with the 16 h.p. Sergant engine. This machine, a wire-braced monoplane, has been flying successfully and on preliminary tests climbed easily to 6,500 feet.

It will be seen that Belgium is rapidly taking up the construction of aircraft, particularly of the light aeroplane and sporting types and the amount of success achieved by Lieut. V. Simonet on the Poncelet glider and light aeroplane at Vauville and Lympne and in Belgium can be taken as an indication of future successes.

From Holland to Dutch East Indies.

In the coming spring an attempt will be made to fly from Amsterdam to Batavia, via Prague, Constantinople, Aleppo, Basrah, Karachi, Calcutta, Rangoon, Bangkok, Sengora and Muntok, a total distance of 9,321 miles. The machine to be used is a Fokker F.VII to be fitted with a 360 h.p. Rolls-Royce engine and the pilot will be T. Van der Hoop, who is already well known on the Amsterdam-London service of the K.L.M.

The East Indies and Oil.

The following extract from a letter received from Capt. A. P. Lamplugh, of the Union Assurance Company of Canton, who has recently returned from the Far East will be found of interest to those who are interested in the strategy of the next war :—

"With regard to your interesting article on Singapore and the Oil Supply I think perhaps I am in a special position to back up your arguments. I have twice visited the American Fort and Base, the only one in the Philippine Islands, to wit, Corregidor.

"The question of eventual occupation of the Philippines by the Japanese was discussed in every American Mess at which I was a guest. The concensus of opinion was that the Japanese could take and hold the Philippines, that is with the exception of the fortification of Corregidor, which is provisioned I understand for three years, and arrangements are made for the gathering of all Americans that cannot be got away at Corregidor in the event of war. It is an accepted theory that with the exception of this fort the Philippine Islands would fall like a ninepin to the Japanese.

"Our own arrangements in the event of war are as follows (I believe they are known as Scheme F5 at the War Office) :—In the event of outbreak of war with Japan without American assistance we should have to evacuate Hongkong. The China Squadron would go to sea, and if possible the one white and two native battalions would be withdrawn. The only troops left there to put up any sort of show would be the Gunners (four 9.2 and twelve 6-inch guns) and the Volunteers, the authorities hoping to evacuate all women and children and the large element of war-time indispensables by steamer to Singapore on the declaration of war, or as an alternative to Saigon.

"I mention this purely because it quite sustains your theories on the subject."

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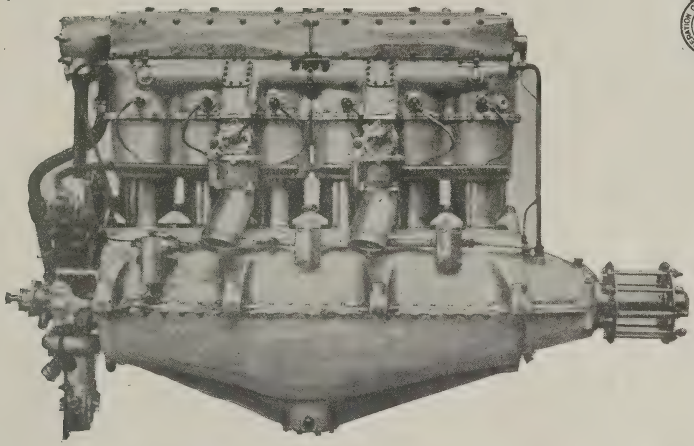

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Maximum B.H.P., 255
Running Weight per normal H.P., 3·25 lbs.
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THE ROYAL AIR FORCE.

London Gazette.

Jan. 22.

General Duties Branch.—The follg. Flight Cadets having successfully passed through the R.A.F. Cadet College are granted permanent commns. as Pilot Offs. with effect from Dec. 19, 1923, and with seny. of the dates indicated :—J. L. F. Fuller-Good (Aug. 15, 1923); N. Young, G. C. A. Armstrong, E. S. C. Davies, J. E. Gray-Hill Thomas, R. R. Reedman, W. C. Ward, E. A. McKinley-Hay, M. D. Ommanney, R. B. H Jackson, H. M. Groves, C. C. Edwards, H. R. F. Baxter, C. W. Moss, J H. Hutchinson, L. W. Dickens N. W. F. Mason, F. W. L. C. Beaumont, W. J. P. Sloan (Dec. 19, 1923). A. H. J. Howlett is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, Jan. 9.

The follg. Plt. Offs. are promoted to the rank of Flg. Off. :—H. S. C. Bassett, J. B. Wilson (Oct. 1, 1923); R. Collins, F. W. M. Downer, G. F Reeves, M. C W. C. Flint, M.C., A. C. W. Richards, M. B. F. Watson, C. Denison, D. McG. Morphy, A. Thomson, B. R. C. Coope (Dec. 10 1923); R. G Chapell (Jan. 14).

Air Commodore C. L. Lambe, C.B., C.M.G., D.S.O., is restored to full pay from half-pay (Dec. 11, 1923); Plt. Off. J. T. Sykes resigns his S.S. commn. (Jan. 10).

Reserve of Air Force Officers.—The follg. offs. are confirmed in rank, with effect from the dates indicated :—

Flg. Offs.—R. C. Armstrong, D.F.C. (Dec. 9, 1923); D. A. Hughes (Jan. 17).

Plt. Offs.—J. F. Greenwood (Dec. 11, 1923); F. A. Ledgard (Jan. 3); C W. Daggett (Jan. 17).

Flg. Off. W. W. Saunders relinquishes his commn. on account of ill-health, and is permitted to retain his rank (Dec. 20, 1923).

Jan. 25.

General Duties Branch.—Wing Cdr. P. K. Wise, C.M.G., D.S.O., is placed on half-pay, scale B (Dec. 22, 1923); Obs. Off. J. F. H. Stevens to take rank and precedence as if his appt. as Obs. Off. bore date Oct. 16, 1922, immediately follg. the name of Flg. Off. G. V. Carey on the gradation list. The reduction to take effect from Dec. 18, 1923.

Appointments.

Week ending Jan. 28.

General Duties Branch.—Group Captain E. F. Briggs, D.S.O., O.B.E., to H.Q., Iraq, for Technical (Staff) duties, 2/1.

Squadron Leaders A. T. Williams, to No. 4 F.T.S., Egypt, 14/1; R Addenbrooke-Prout, O.B.E, M.C., to R.A.F. Depot, 15/1.

Flight Lieutenants A. Ferris to Palestine Wing H.Q., 23/12; W. R. Cox, M.C., A.F.C., to No. 216 Sqdn., Egypt, 23/12; C. F. Horsley, M.C., to No. 14 Sqdn., Palestine, 23/12; F. J. W. Mellersh A.F.C., to No. 4 F.T.S., Egypt, 23/12; A. R. M. Rickards, A.F.C., to No. 4 F.T.S., Egypt, 4/1; A. C. Bayley, to H.Q., Egypt, 28/12; R. A. Courtney, M.B.E., to H.Q., Egypt, 23/12; J. Noakes, A.F.C., M.M., to Engine Repair Depot, Egypt, 28/12; A. M. Blake, A.F.C., F. MacB. Paul, and C. J. W. Hatcher, A.F.C., to No. 4 F.T.S., Egypt, 23/12; G D. Daly, D.F.C., to No. 208 Sqdn., Egypt, 23/12; F. A. Norton, to H.Q., Coastal Area, on transfer to Home Estab., 6/2.

Flying Officers R. J. Montgomery-Moore and J. Turner, to Engine Repair Depot, Egypt, 23/12; R. S. Bruce, to No. 208, Sqdn., Egypt, 23/12; L. E. Dowse, to No 2 Armd. Car Coy., Palestine, 23/12; G. S. Shaw, to R.A.F. Base, Caishot, 30/1; F. J. C. Rybot, to No. 2 Sqdn., Andover, 4/2; H. L. P. Lester, to No. 20 Sqdn., India, 18/1; H. W. Clayton, to No. 1 Sqdn., Iraq, 18/1; J. Bowen, to H.Q., Iraq, 18/1; A M. West to No. 5 Armd. Car Coy., Iraq, 14/1; R. W. Pontifex, to No. 6 Sqdn., Iraq, 21/12.

Pilot Officers H. M. Groves, C. W. Moss, M. D. Ommanney and R. R Reedman, to No. 4 Sqdn., Sth. Farnborough, instead of to School of Army Co-operation, 19/12; D. G. Pinnell, to No. 5 Sqdn., India, 18/1; H. V. Michell and T. J. Woods, to No. 6 Sqdn., Iraq, 18/1; W. J. E. Rodwell, to No. 20 Sqdn., India, 18/1; A. C. St. G. Gratte, to Aircraft Depot, India, 18/1; H. P. Morris, N. H. F. Unwin, E. R. Newbiggin, to No. 8 Sqdn., Iraq, 18/1.

Medical Branch.—Squadron Leaders (Medical) T. J. Kelly M.C., M.B., B.A., to Basrah Combined Hospital, 22/12; R. W Ryan, M.B., to Station Commandant, Iraq, 23/12; P. T. Rutherford, O.B.E., to H.Q., Egypt, 18/1; Flight Lieutenant (Medical) F. E. Johnson, to Baghdad Combined Hospital, 23/12; E. G. S. Hall, M.B., to H.Q., Egypt, 12/1. Flying Officers (Medical) I. G. Russell, M.B., B.A., and C V. D. Rose and G. Clark, M.B., to Basrah Combined Hospital, 23/12.

Store and Accountant Branch.—Flight Lieutenant (Stores) L. H. Vernon, to Stores Depot, Egypt, 23/12. Flying Officers (Stores) E V. Bashford and G. A. Longhurst, to Stores Depot, Egypt, 23/12; J. H. P. Clarke, to Aircraft Depot, India, 18/1. Flying Officer (Accountant) J H. B. Carson, to Aircraft Depot, Iraq, 18/1. Flying Officer (Stores) J Lundon, to Aircraft Depot, Egypt, 23/12; Pilot Officer (Accountant) J Charles, to No. 111 Sqdn., Duxford, 25/1.

Chaplains' Branch.—The Rev. M. J. Eland, to H.Q., Iraq, 28/12.

H.M.S. Hermes.

With the re-appointment of several officers to the *Hermes* it is expected that this new aircraft-carrier will be ready to join the Atlantic Fleet on or about Feb. 5. At present the Atlantic Fleet is without any aircraft-carrier on its spring cruise, as the *Argus*, which has been attached to it since the war, is under refit at Portsmouth and will not be out of dockyard hands until next month. The *Hermes*, which was to have been ready by the new year, has been delayed.

55 Squadron Re-union.

The Annual Re-union Dinner of the 55 Squadron Association will be held on Mar. 8 at 8 p.m.

Members are requested to forward their subscriptions for the current year, with an intimation as to whether they will be able to attend the dinner, to the Hon. Sec. Sq. Ldr. Nicholas, A.E.E. (Home) Martlesham Heath, at the earliest possible moment.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Rugby Football.

R.A.F. v. Cambridge University :—This match should have been played on Jan. 23 at Cambridge but owing to the railway strike it was necessary to cancel it.

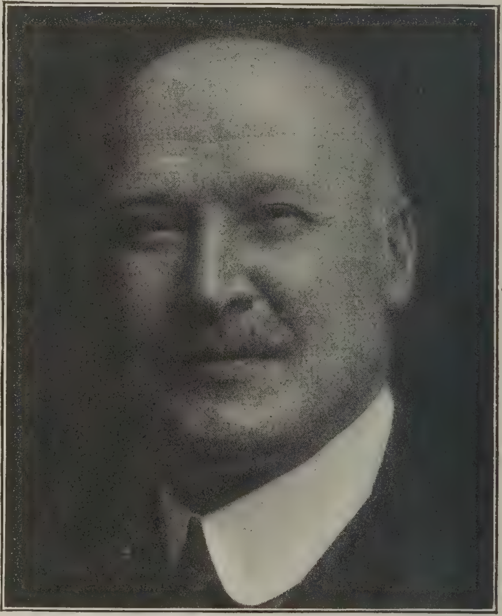
R.A.F. v. Bristol :—Played at Bristol on Jan. 26 this match resulted in a win for Bristol by three goals and a try (18 points) to one goal and two tries (11 points). The R.A.F. tries were scored by L.-AC. Snaith (2) and Flt. Lt. T. Lowe (1) The Air Force put up a good fight and finished strongly but were beaten behind the scrum, the handling of the Bristol backs being infinitely superior.

A Memorial to Dr. Swan.

In response to a wide and general wish a fund has been opened for a Memorial to the late Doctor Charles Atkin Swan for whose generous and unselfish medical services so many have cause to be grateful.

Soon after the outbreak of War Dr. Atkin Swan founded the photographic section of the R.F.C. and flew over the lines in France where he was among the first to take photographs from an aeroplane in actual war. When the photographic department of the R.F.C. was firmly established he was appointed physician to the R.A.F. hospitals in Eaton and Bryanston Squares, and had over 6,000 pilots and observers as out-patients.

The object of the Fund is to endow a Dr. Atkin Swan Cancer bed at St. George's Hospital and the sum required is about £1,000. Contributions should be sent to the Atkin Swan Memorial Fund, Westminster Bank, 1, Cavendish Square, W.1.



The late Dr. Atkin Swan.

Unobservant.

During gun practice with live shells from the Khartoum Fort recently a rail on the Khartoum-El Obeid lines of the Egyptian State Railways was struck and broken. The damage was not noticed by either the gun crew or the observing aeroplane with the result that a goods train was derailed. Which seems to indicate that the aeroplane was not observing.

A Dutch Subsidy.

The Dutch Parliament has passed a bill which is to grant a subsidy of 1,400,000 florins to the K.L.M. The subsidy is to be used to exploit air lines between Holland and the neighbouring states and is to be spread over a period of four years (1923-26) in the following manner :—1923, 400,000 fls., 1924, 400,000 fls., 1925, 300,000 fls., 1926, 300,000 fls.

The growth in the traffic on the K.L.M. since 1920 is shown in the following figures : 1920, 345 passengers and 21,963 kgs. of freight. 1923 (first nine months), 3,537 passengers and 131,675 kgs. of freight.

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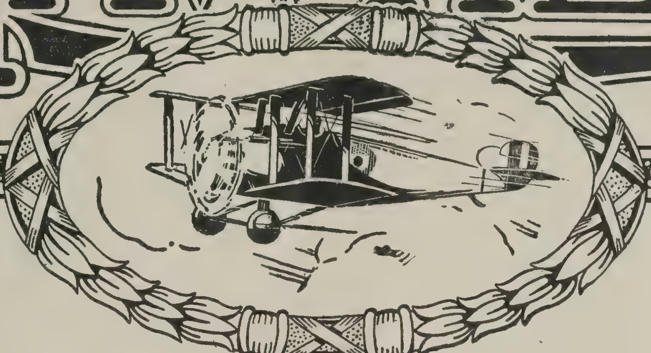

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THE REORGANISATION OF THE TECHNICAL DEPARTMENT.

The Air Ministry's announcement of the impending dissolution of the Department of the Director of Research and the replacement thereof by two departments, one concerned with Scientific Research and the other with Technical Development was the subject of brief and general comment in the last issue of THE AEROPLANE.

Quite apart from the question as to whether in principle it may be expected that two departments will be enabled to handle the technical business of the Air Ministry better than the previous single department the reorganisation now impending raises a number of distinctly interesting questions as to the exact scope of the two new sub-divisions.

The semi-official explanation and justification of the reorganisation which was issued to the Press at the first publication of the announcement proper shows signs that certain of these problems have already been foreseen. References in practically all the more reputable daily papers in precisely similar terms to the position of the R.A.E. at Farnborough, which will have to carry on Research for the Research Department and experiment for the department of Technical development indicate that some of the minor problems of organisation which will be encountered have already received some consideration.

DIVIDING LINES.

It may however be pointed out that this particular difficulty which to some extent must crop up in connection with Martlesham Heath, the Marine and Armament Experimenta Station at Grain (or Felixstowe) and even at the N.P.L. is only a minor difficulty of administration. A much more difficult question for which an answer will undoubtedly frequently be sought is the question of where Scientific Research ends and Technical Development begins. Any difficulty which may arise in connection with the administration of official experimental establishments is merely a subsidiary result of the difficulty of drawing any definite boundary between Research and experiment for practical ends.

There is no dividing line in fact. Research that does not increase the sum of useful—that is eventually usable—knowledge is itself useless. In a somewhat vague manner it is possible to distinguish between knowledge for which an immediate practical use can be found and knowledge whose direct influence on practical affairs cannot be foretold with any accuracy. In an equally vague way one might label search for the first type of knowledge as coming under the heading of practical experiment and search for the second type as being of the nature of pure research. But no such definition provides a clear division.

WORK THAT CAN BE CLASSIFIED.

It has been suggested that research work might be defined as embracing all scientific work which was beyond the understanding of the average practical technician or engineer. This might form a useful working definition for a Director of Technical Development: any particular branch of experimental work which he thought he understood he could claim as coming under his department, whereas anything which he could not understand he would at once refer to the Director of Scientific Research. But although this definition might work that way it would not necessarily work in the reverse sense—unless the understanding of the D.S.R. stopped short accurately at the same boundary but on the other side thereof as that of the D. of T.D.

It would certainly be possible to agree that certain classes of work came definitely into the scope of one or other Department. Nobody it may be imagined would suggest that D.T.D. should take under his wing work tending to the development of a theory of aerodynamics, or that D.S.R. should father the development of all-metal aircraft. This method of dividing work up and classifying it according to the object for which it is undertaken however breaks down in many cases and is apt to lead to difficulties in most.

AND WORK THAT CAN'T.

The designer of aircraft looks to the research worker for knowledge which will help him to produce better aircraft. The research worker looks to the aircraft designer to put his experimental results to practical tests and to confirm—or otherwise—the inferences that he has drawn from experiment in the laboratory.

A model aeroplane is tested in the wind tunnel a full-size machine to the same design is tested in free flight. The result of the comparison between model and full-size performance provides the research worker with data which may be very important from the purely theoretical point of view. The same result is important to the designer as giving him some data from which to estimate the performance of other machines from model figures. The same experiment therefore may be regarded as either coming within the domain of research or of practical experiment.

As the results of such tests are definitely useful to designers whereas they are only potential aids to the research worker in his search for a theory of scale effect it will probably be argued that such work should be regarded as appertaining to D.T.D. But it may be pointed out that if the research worker succeeds in formulating a reliable theory of scale effect and in producing methods by which the designer can safely calculate full-scale results from model figures, then his work will become of direct practical value to the designer and will render experiment of this particular type unnecessary. The production of such a theory is just as much a matter of practical technical development as full-scale tests for comparison with model figures.

The common interest of the practical designer and the aeronautical scientist in the same experimental results, and the interdependence of the two classes one upon the other for the data from which they must work extends over practically the whole range of aeronautical experiment.

WHERE DISSENSION MAY ARISE.

Therefore it would seem that the two new sub-departments of the present Directorate of Research will find it possible to draw up a programme of experiment in which they are commonly interested, to which common programme each will add a further programme of interest to itself alone.

Obviously this is what will happen, to some extent, but as each department will regard each experiment from a different point of view there is the possibility of a considerable divergence of opinion as to the conditions under which any particular experiment shall be carried out. In other words there will be enormous opportunities for the development of discussions, conferences and compromises between the two departments as to actual procedure with the agreed programme of experiment. This will of course increase the importance of the Departments but will not facilitate experiment.

So far as concerns the type of research which deals with the theory of aerodynamics it seems fairly safe to prophesy that the new move will have absolutely no effect. The development of aerodynamical theory is work for a very restricted class of men of unusual mental attainments which are certainly not likely to be exercised to any advantage under Governmental control. The most illuminative step yet taken towards the foundation of a theory of aerodynamics was taken in this country by Mr. Lanchester many years ago. His suggestion was treated with contumely by that curious class of officially-supported scientist which the Government's unfortunate grandmotherly interest in aviation has created. As the theoretical side of the Directorate of Scientific Research will pretty certainly be under the influence of this same class it is unlikely greatly to distinguish itself in this line.

There are very good grounds indeed for the division into two separate departments of the existing Directorate of Research. But the division which is actually to be made does not appear to be that most likely to produce satisfactory results.

A BETTER SUB-DIVISION.

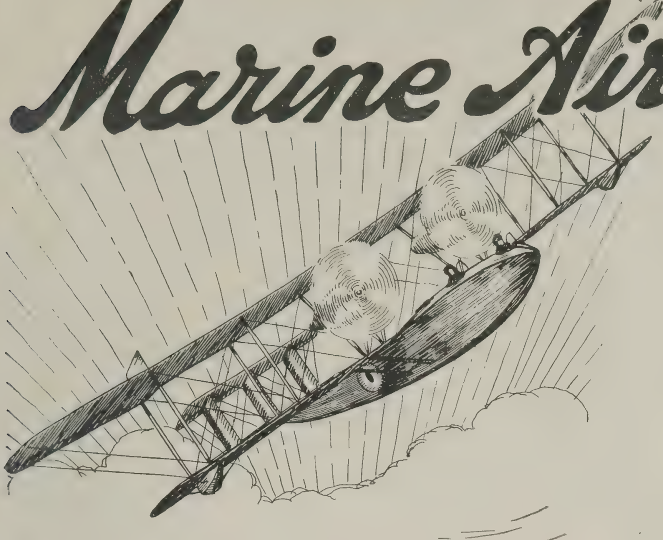
A better sub-division from many points of view would be that into an Experimental Department and a Technical Supplies Department. The present Directorate of Research should relinquish to the Supplies Department all responsibility for the production, inspection and testing of aircraft designed and built specifically as service types.

It should be the business of the Experimental Department to carry on all purely experimental work such as can be carried out in the existing official experimental stations, and to get produced as experiments pure and simple any new types of aircraft, engines, or accessories which it considers worthy of test. Naturally the experimental department should be in constant touch with the Technical Supplies Department and the Aircraft Industry on the one hand, and the Aeronautical Research Committee on the other hand, and it should regulate its programme of work—so far as finances permitted—with an eye to an all-round progress in the future rather than to the immediate needs of the moment.

For instance the experimental department should not have to draw up specifications for new service aircraft. Such specifications should be prepared by the Supplies department who would naturally seek the guidance of the Experimental section as to whether they were asking in any given case for either more or less than was technically possible. The Supply people—representing the actual Service user—would determine from the purely Service point of view what compromises between various conflicting requirements were justifiable in any given type.

The Experimental Department should be free to build as experiments machines in which any particular characteristic or peculiarity was pushed to such extreme limits that the machine was useless except as an experiment. All practically useful machines are compromises—but one cannot tell to what extent one is actually compromising in any one case unless there is some data as to what can be achieved if compromise is abandoned. For instance, experience with single-seat fighters alone would certainly have failed—as yet—to

Marine Aircraft



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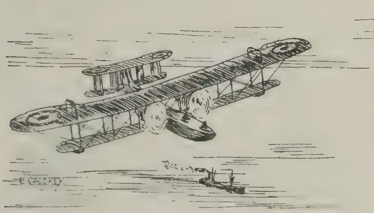

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suggest that a 260 m.p.h. single-seater was a practical possibility. By concentrating on the attainment of maximum speed to the exclusion of practically every other requirement this speed has been attained—and as a result the performance of the single-seat fighter will undoubtedly be appreciably increased in the near future.

The dividing line between the two sections would then be that the Experimental Department would be charged with all technical experiment up to the stage at which it was felt that any specific development had been carried to such a stage that it could be regarded as of such utility that it could be recommended to the Supply Department as ready for trial in actual service.

It may be objected, however, that this would leave the experimental department in charge of the same wide and mixed field of experiment, research, and technical development work as is now covered by the Directorate of Research. This is not the case. At present the D. of R. is responsible for aircraft designed for specific practical purposes and this fact has the effect of limiting the scope and nature of the experimental work undertaken very largely to the immediate end of producing and equipping these aircraft. Also the department responsible for these aircraft has an interest in fitting them out with all the latest gadgets and fittings which it has itself developed, and a natural tendency to prefer its own devices to any designed to the same end which may have an external origin. If it has to justify the results of its experiments to an independent department before its particular ideas are put into service, experiment is likely to be more thorough and to be devised with more of an eye to future needs than can be the case at present.

Again it may be objected that the suggested experimental department might quite properly be called a Research department and that therefore the whole argument is only one of nomenclature. It is quite true that one might describe all the work of such a department as research. It is equally true that much of its work could properly be described as Technical Development. It is perfectly certain that the suggested experimental department would not placate those whose agitation for more "Research" work has largely been responsible for the new organisation.

This agitation has been based on the supposition that there is some sort of opposition between the needs of scientific research and of practical technical development, and that both cannot be carried on under the same auspices without the subordination of scientific to practical requirements. This view is largely based on the mutual ignorance of scientists and engineers as to each other's work, and on the undoubtedly evil effects of trying to carry out experiments and practical manufacturing processes under the same control.

It is not possible to separate research from experimental development. It is possible to separate research and experimental development from practical manufacture and if that separation can be effected, research and experiment can quite well be conducted under unified control—provided that the purely personal and professional prejudices do not unduly interfere.

Dopes and Fabric at the R.Ae.S.

On Thursday Jan. 24, Dr. J. E. Ramsbottom of the Royal Aircraft Establishment read a paper on Dopes and Fabric before the Royal Aeronautical Society. The paper is very largely of a statistical nature, giving large numbers of tables and figures relating to the tautness and strength of various fabrics treated in various ways with a variety of dopes and pigments under exposure to changes of temperature, humidity and exposure to light. It is necessarily of a nature to appeal rather to the specialist—who will doubtless find cause for argument in it—than to the general reader and it is of a length and consistency which do not fit it for more than mention in these pages.

The Structure of Rigid Airships.

The paper entitled "Some Problems in Connection with the Structure of Rigid Airships" read by Lt.-Col. V. C. Richmond before the Institution of Aeronautical Engineers on Friday Jan. 25 dealt in a general way with the results of recent investigations into the structural design of rigid airships. It will easily be recognised that these problems are of a distinctly intricate and complex nature, and the paper in question was of so general a kind that it would be entirely unwise to attempt still further to generalise and compress it in the absence of any detailed knowledge of the process of airship design.

The general conclusions gathered from the paper are however of some interest. Col. Richmond states that cases of structural failure of rigid airships under normal flying have been extremely few, particularly considering the conditions under which airships were produced during the war. He points out that in ships of the type of R.38 and L.71 structure weight was cut to achieve abnormal ceilings, and that a reduction in the disposable lift of these ships of about 10 per cent. would have sufficed to double their longitudinal strength.

Up to the present rigid airships had almost slavishly followed conventionalised practice, but recent study went to show that radical departures from the characteristic Zeppelin structure could be made with advantage, certainly in large ships.

To those who desire to study the question in greater detail it is recommended that the paper in its complete form should be studied, when it is published in the Proceedings of the Institution.

How It Is Done.

The following extract from a letter from an aircraft designer will be of interest to those who desire reform in the Air Ministry :—

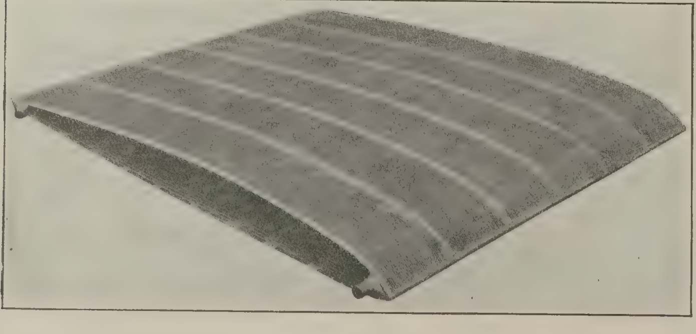
"We are now designing a —— machine—at least the Air Ministry experts are; we simply look on. Every week almost some half-dozen come down to criticise the mock-up, and in between their visits an odd one or two drift in, alter something that affects something for which someone else is responsible so that when the latter gentleman arrives next time he has to put it all right again, incidentally upsetting a third expert's arrangements.

"Then to cap the lot in a week or two they are all transferred to another branch and a fresh lot have to come down. And they, of course, have entirely different views and ideas on requirements."

A Noteworthy Test.

Notification has been received that the 1,000 h.p. Napier Cub engine has now been officially accepted by the British Air Ministry having passed the various strenuous tests imposed by the Technical Department, including a run on the bench of 53 hours.

The Napier Cub is the highest-powered aero engine in the World and it speaks well for the excellence of Napier design and workmanship that Great Britain should have thus established the lead in aero engine construction. The Avro-Napier, which is a species of enlarged Avro-Aldershot with the 1,000 h.p. Cub engine, has been flying for quite a considerable time and has done very good work but all its flying has been of a purely experimental nature and did not imply that the engine in the machine had been definitely accepted as a standard type. Nevertheless that particular engine has performed very satisfactorily indeed.



THE CURTISS WING RADIATOR.—The photograph shows a top wing radiator unit for the Curtiss Oriole machine. The radiators used on Curtiss racing machines are of exactly similar construction. The units are built up from very thin corrugated brass sheet, with header compartments along the leading and trailing edges. Owing to the very thin film of water contained between the two skins of the radiator proper it is said that leakage through a hole such as produced by a rifle bullet is quite slow.

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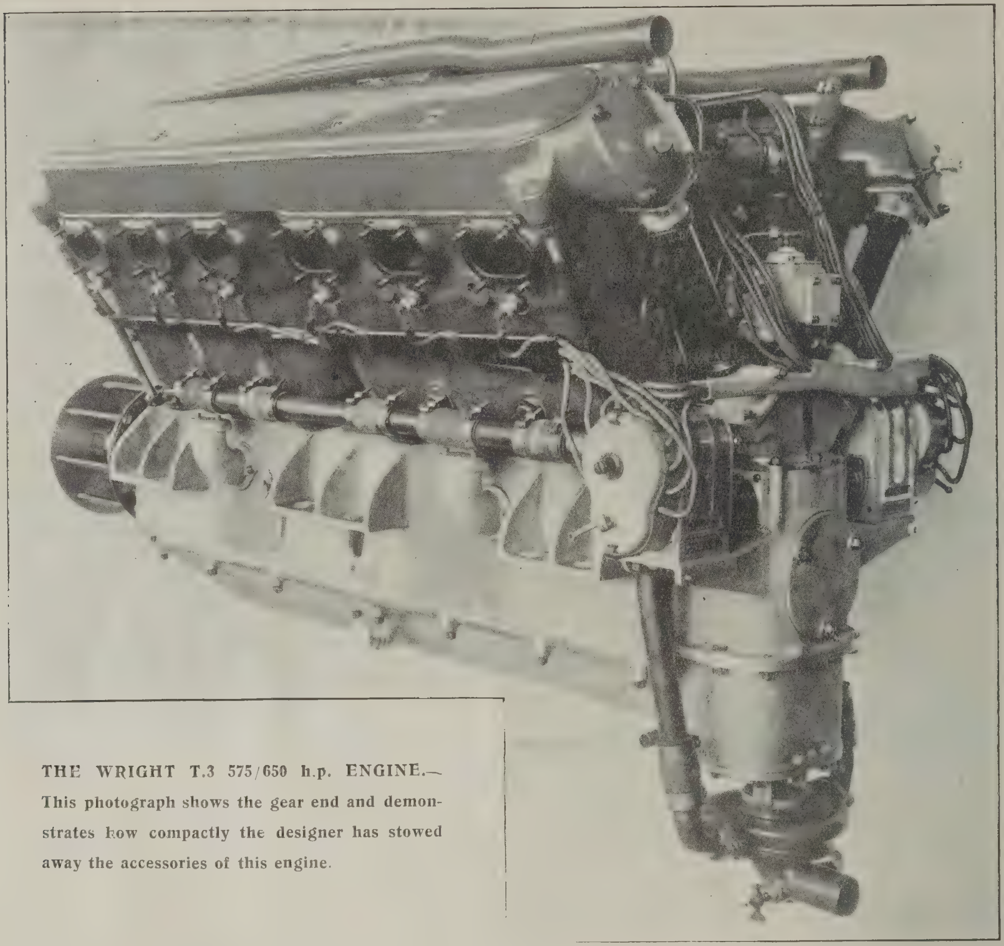

THE WRIGHT T.3 575/650 h.p. ENGINE.—This photograph shows the gear end and demonstrates how compactly the designer has stowed away the accessories of this engine.

New Technical Literature.

R. & M. No. 797. On the rate of Transmission of Heat from the Walls of an Airship Passenger Car. By Miss D. Marshal. Price 6d. net.

R. & M. No. 819. On the Determination of Stresses in a Braced Framework. Part IV. The Effects of Axial Loading, Flexure, Torsion and Shear upon a Tubular Framework with Taper. By R. V. Southwell. Price 6d. net.

R. & M. No. 831. On the effect of Sideslip on the Aerodynamic Forces and Moments for a Model S.E.5a. Aeroplane. By H B. Irving and A. S. Batson. Price 1s. net.

R. & M. No. 855. Some Suggestions for Improving Aeroplane Control at Low Speeds. By A. Fage. Price 6d. net.

R. &M. No. 856. Some Experiments on a Model Biplane having Slotted Wings with particular reference to the Improvement of Lateral Control at Low Speeds. By H. B. Irving and A. S. Batson. Price 6d. net

American Advisory Committee Reports.

With reference to recent notices concerning the Reports and Technical Notes issued by the American National Advisory Committee for Aeronautics, The Aeroplane has been notified by the office of the Technical Assistant to the N.A.C.A. in Europe that all inquiries for copies of these publications should be addressed to the National Advisory Committee for Aeronautics, 3341, Navy Buildings, 17th and B Streets, N. W. Washington, D.C., U.S.A., and not to the Paris office.

A Big Oil Contract.

A communication from the firm states that the most important contract for oil placed in this country by the Air Ministry since the War 1914-18 has just been accorded to the firm of Frank How and Co., Trogon Wharf, High Street, Stratford, E 15, for use in aircraft engines.

The firm manufactures and blends lubricating oils, greases and dressings for every known purpose, all of which are known under the trade name of Trogon. As suppliers of lubricating substances to the War Office, the Post Office, the Metropolitan Water Board, the Crown Agents for the Colonies, the leading railway companies, engineers, collieries and municipal authorities they have experience to deal with aero-engine lubrication, and the fact that they have been chosen by the Air Ministry to supply oil in bulk for the Royal Air Force would indicate that their products, which have come to be known in other branches of engineering, are among the best for aeronautical work.

The order is the more remarkable because a few months ago Air Ministry officials stated definitely that the Air Force had enough oil in stock to supply all needs for several years. Apparently the amount of flying done of late has exceeded expectations.

Company Notices.

Navarro-Wellesley Aviation, Ltd.—Satisfaction to the extent of £4,500 on Mar. 29, 1923, of mortgage dated Sept. 13, 1920, securing £10,000. (Notice filed Jan. 10.)

Aircraft Disposal Co., Ltd.—Particulars filed of £522,000 debentures authorised Dec. 29, 1923, charged on the company's undertaking and property, present and future, including uncalled capital, the whole amount being now issued.

[This new issue of debentures is, one gathers, merely a method of putting back into working capital certain profits earned for the shareholders in the recent period of successful trading and does not indicate that the firm has been compelled to seek fresh financial support.—Ed.]

Gloucestershire Aircraft Co. Ltd.—Mortgage on the "Park Farm," Brackworth and Hucclecote, Glos., etc., dated Dec. 31, 1923, to secure all moneys due or to become due from company to the Midland Bank Ltd.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 3; Tuesday, 13; Wednesday, 0; Thursday, 13; Friday, 5; Saturday, 0; Sunday, 6.

LONDON—PARIS—ZURICH:

Handley Page Transport, Ltd., machines 7, passengers 25, freight 3,664 lbs.

LONDON—OSTEND—COLOGNE.

Instone Air Line, Ltd., machines 11, passengers 18, freight 9,420 lbs.

LONDON—ROTTERDAM—HANOVER—BERLIN:

Daimler Airway, machines 7, passengers 3.

PARIS—LONDON:

Air Union, machines 9, passengers 12, freight 8,148 lbs.

LONDON—ROTTERDAM:

K.L.M., machines 6, passengers 4.

SPECIAL MACHINES: 0.

Total number of trips by British machines: 25, carrying 46 pas. Foreign machines: 15, carrying 16 passengers.

COMPARATIVE FIGURES:

For week ending Jan. 27:

Machines, 40; Passengers, 62; Crews, 62; Total personnel, 124.

Corresponding week 1923:

Machines, 63; Passengers, 131; Crews, 123; Total personnel, 254.

Corresponding week, 1922:

Machines, 13; Passengers, 30; Crews, 20; Total personnel, 50.

Corresponding week, 1921:

Machines, 15; Passengers, 5; Crews, 17; Total personnel, 22.

Croydon Notes.

The Air Lines in spite of glowing reports in the newspapers have not benefited much from the strike and the passenger traffic has shown little fluctuation. This is because the Continental train services have been well maintained. On the other hand goods traffic has shown a slight tendency to increase.

Large consignments of flowers from the Riviera are arriving in London by air.

On Monday of this week a Handley Page aeroplane took from London to Paris a cargo of more than a hundredweight of platinum valued at £50,000. It was collected from a London bank at 11.00 hrs. and was delivered to the consignee in Paris at 14.30 hrs.

An importer in Cologne whose import licence expired at noon on Saturday telegraphed to Gosport on Friday for five Blackburne motor-cycles and a sidecar. These were placed on the 16.00 hrs. train to London and thence by motor lorry to Croydon. On Saturday morning they left for Cologne in a D.H.34 and arrived at Cologne at 11.45 hrs. The consignment was then rushed through the Customs just before the licence expired.

On Tuesday a Farman Goliath on arrival from Paris landed in the far corner of the aerodrome, where the ground is rough, tipped on its nose (or "put itself in pylon," as the French papers said) and burst into flames. The crew and two passengers (one of whom was an African Sheikh in full dress) escaped unhurt, the crew through the pilot's cockpit and the passengers through the nose of the machine which opened in the crash and decanted them on to the grass and the Goliath was burnt to nothing. Like the mother of James James Morrison Morrison Weatherby George Dupree, immortalised in last week's *Punch,* it "hasn't been heard of since." From the same poem Goliaths might take warning and "never come down at that end of the ground unless you come down gentle."

Incidentally there was a necklace valued at £30,000 on the machine. Four days later the underwriters informed the authorities that the necklace was on the machine and asked if it had been seen. As no such thing had been found the site of the accident was searched and the necklace was found in the grass undamaged except that a small piece of the enamel had been chipped.

On Monday of this week Mr. William Leach, Under Secretary of State for Air, made a tour of inspection of the aerodrome and expressed himself exceedingly interested. Accompanied by General Festing and sponsored by Colonel Bristow and assisted by Major Greer and piloted by Mr. F. L. Barnard he had his *baptême de l'air* in a D.H.34. He was initiated into the mysteries of direction-finding by wireless and after about an hour in the air the machine landed. Mr. Leach seemed very enthusiastic and his early acquiring of practical knowledge augurs well for his future as Under-Secretary.

Mr. Perry made a demonstration flight on a Tinsyde during the week for the Aircraft Disposal Company.

Manchester-Belfast Air Service.

As the result of the air mail experiments between Manchester and Belfast a contract will probably be signed shortly for a regular daily service of one machine per day in each direction between the two cities. The service will begin in February. The contract is between the De Havilland Aircraft Company Ltd. and a group of Belfast business men who are prepared to guarantee the necessary amount of traffic.

D.H.50 machines will be used and one machine will leave Manchester in the early hours carrying newspapers and other matter and return from Belfast in time to catch the evening mail from Manchester. Normally the journey in each direction should take 2½ hours.

Testing Fairey Aeroplanes.

The Fairey Aviation Company have now engaged Mr. Norman Macmillan as their permanent test pilot. Lt.-Col. Vincent Nicholl who up till lately has done all the test work for the firm, is now too much occupied with the business of the Fairey Company of which he is a Director to do all the testing of the great number of machines now being produced in series, though he still flies machines of new types with his well-known skill, and tries-out occasional machines of the series for his own edification.

Mr. Macmillan's ability as a pilot is well known, and his careful methodical manner of testing machines and of tabulating his results while in the air has long been recognised. Both Mr. Macmillan and the Fairey Aviation Company are to be congratulated on acquiring one another.

Air Affairs in Parliament.

AIRSHIPS.

On Jan. 21 in the House of Commons the SECRETARY OF STATE FOR AIR in a written answer to a question by MR. WELLS who is anxious about the unemployed in Bedford, said that the settlement of the airship agreement was not yet complete, having proved complicated. It had been arranged to start preliminary work at Cardington as soon as the necessary legal documents had been settled. The scheme could not begin until Parliamentary approval had been obtained.

On Jan. 22 in reply to a question by MAJ. SIR BERTRAM FALLE, who would like H.M. aeroplanes and airships to be built and repaired in Portsmouth Dockyard, the SECRETARY OF STATE FOR AIR said that in this respect the policy of the Air Ministry had not altered since the question was asked in July last. As regarded airships the question did not arise because the construction of airships by the Government was not in contemplation and negotiations for handing over existing facilities for construction to a commercial company were in progress.

PERSONAL NOTICES.

DEATH.

STEVENS.—At Quetta, on Jan. 25, as the result of a flying accident, L.-AC. Stevens, R.A.F.

ENGAGEMENT.

FREEMAN—WATSON.—The engagement is announced of Mr. C. T. Freeman, D.S.C., A.F.C., late Major R.N.A.S. and R.A.F., only son of Mr. and Mrs P B F. Freeman, of Southgate, and Margaret Leonora, second daughter of Mr. and Mrs J. J. E. Watson, of Potters Bar.

BIRTHS.

BAYLY.—On Jan. 22, at St. Leonards, Tring, Herts, to the wife of Flt. Lt. L. J. St. G. Bayly—a daughter.

LAMPLUGH.—At Moseley, on Jan. 26, to Capt. and Mrs. A. G. Lamplugh—a son.

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PATENTS.

THE PROPRIETOR of the Patent No. 160,065 for "Improvements in or relating to Aeroplanes" is desirous of entering into arrangements by way of licence and otherwise on reasonable terms for purpose of exploiting same and ensuring its full development and practical working in this country.—All communications should be addressed to Haseltine Lake and Co., Chartered Patent Agents, 28, Southampton Buildings, Chancery Lane, London, W.C.2.

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SENIOR DRAUGHTSMAN with aircraft experience required. Give full particulars and enclose references to The Blackburn Aeroplane and Motor Co., Ltd., Brough, E. Yorks.

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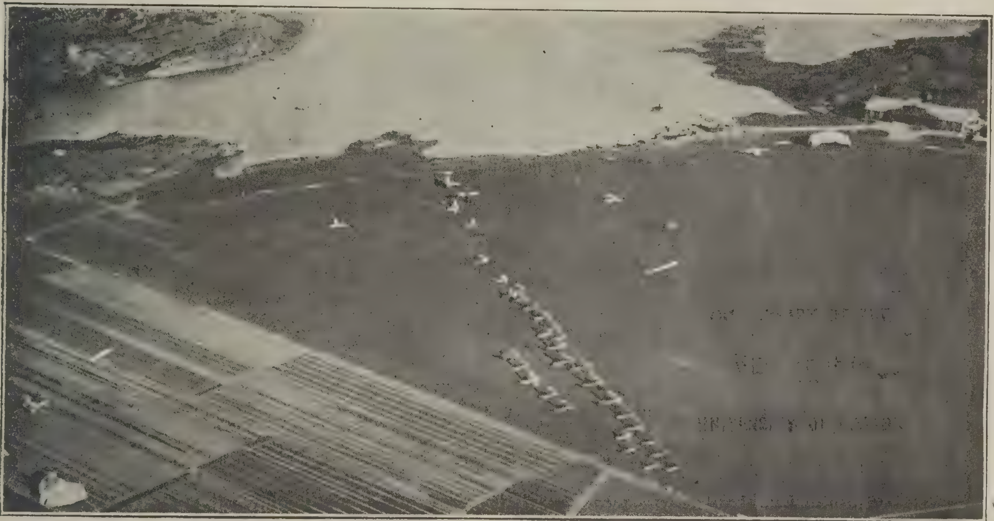
A GATEWAY TO THE NORTH.



TORSLANDA AERODROME: A photograph taken on August 12, 1923, the last day of the Gothenburg Flying Week, showing the line-up of the military and civil competing aeroplanes. In the top right-hand corner can be seen the big permanent hangar with the seaplane slipway to its left and in the bottom left-hand corner the first of the three rows of temporary hangars in which most of the military aeroplanes were parked.

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ON SHORT SERVICE OFFICERS.

Recent remarks in THE AEROPLANE on Short Service Commissions in the Royal Air Force have produced quite a considerable amount of correspondence. Among Short Service officers themselves, or perhaps one should rather say among the relatives of Short Service officers, there appears to be a certain amount of soreness chiefly because as mentioned in the recent article such officers are not informed definitely at a definite date whether their commissions are going to be made permanent or not.

This is of course an irrational attitude because when an officer takes a Short Service Commission he takes it definitely on the understanding that he is going to leave the Air Force on a certain date and that if he does get a Permanent Commission it will be as an act of grace in return for particularly good service.

Naturally the expansion of the Air Force which is now taking place must cause a certain number of vacancies for Permanent Commission officers and naturally those vacancies will be filled from among the Short Service officers. But that is just a matter of luck which has befallen those officers who took Short Service Commissions during the last year or two. The fact that a certain percentage of Short Service officers have been made permanent in that period cannot be taken as a precedent for the percentage of Permanent Commissions to be given to Short Service officers in future.

So far as one can gather, the official policy is ultimately that all permanent officers in future shall have passed through the Cadet College at Cranwell where they will have absorbed the Air Force tradition to its fullest possible extent. Naturally a certain number of the people who pass through Cranwell must turn out to be failures either for physical or mental reasons, but for some years to come it cannot be possible to establish anything like actuarial figures as to the percentage of such figures. The fact that some few of them do have to leave the Air Force will obviously make a few vacancies to be filled by Short Service officers of the same seniority. Also a certain very limited number of Permanent Commissions will be given to aircraft apprentices from Halton and Cranwell and a certain number will be given to Other Ranks. But as a general principle it may be laid down that Permanent Commission officers will all have started their Air Force career as Cranwell cadets.

The general philosophy of the Short Service Commission may be laid down as follows :—

At a moderate estimate there are say 400,000 young men entering upon a self-supporting life in this country each year. Out of this 400,000 there are probably at least 5,000 who feel no particular call to any profession but who have a liking for some sort of career which involves sport or travel or something of a mechanical nature. If left to themselves many young men of this sort would drift from one trade to another or take to no trade at all and in any case would be fairly useless members of society.

With the spread of a general interest in aviation it is more than likely that such young men would take kindly to the idea of flying, much as some few years ago young men of a similar kind were attracted by the idea of motoring as racing drivers or test drivers or something of that sort. It is from the 5,000 or so men of this sort that the Air Force may expect to recruit the Short Service officer, with benefit to the man himself and at any rate without detriment to the Service.

The youngster who goes to the Air Force has for five years a Service life which should at any rate develop certain essential qualities which make for success, such as initiative and a sense of discipline and a habit of handling men and a proper seemliness of life. Also he has a chance of seeing the World, which should broaden his outlook.

During this time he is earning a reasonable income out of which he can put by if he be careful a respectable amount each year. Also, as stated in the previous article, he has under the new educational scheme a chance of learning a useful professional trade.

At the end of his active service he returns to civil life with a gratuity of £75 a year for each year of service, plus whatever he may have saved while in the Air Force. And the total amount should be enough to give him time to look round for suitable employment. In any event he is certainly better equipped for the battle of life and for employment than he was before he joined the R.A.F.

It is not intended that the Short Service officer should have a permanent career in the R.A.F. He may have every intention of making it his permanent career, but the man who succeeds in doing so in the future will be very much the exception. Nevertheless the man who is born to succeed will succeed, and as Sir William Robertson started as a private soldier and became a Field Marshal, so some future Marshal of the Air may have started as a Short Service officer, a much shorter flight of steps. But the main point is that when a man agrees to take a Short Service Commission he must not imagine that he has any grievance if he does not get a Permanent Commission.

As to the question of giving due notice, it is naturally a man's own fault if he forgets the date on which he is due to leave. But one is told that to prevent anybody from feeling any grievance on this particular point all Short Service officers will in future be reminded six months before their term of service expires that they will be due to leave on such-and-such a date.

Therefore on the whole it may be taken that the Short Service officer has a very fair run for his money. He gets at any rate all that for which he bargains and he may possibly get a good deal more.— C. G. G.

OFFICIAL CONTROL IN AMERICA.

Government control of aircraft development in this country has not been attended by very happy results if one is to judge by such samples of aircraft as are to be commonly seen in the air. Judging however from a recent issue of *Aviation* affairs are even worse in the United States. In it the following paragraph occurs :—

> From the advertisements in English and French aviation magazines; which are the indexes of the state of the industry in those countries, it will be seen that practically all airplane, motor, and accessory manufacturers have something to sell and advertise. The real reason is that the foreign manufacturers are allowed to keep a proprietary interest in their development work and are given orders for their own aircraft to the extent of their facilities. While the Government ownership of reproducing rights may have the merit of securing a low price in production orders it is the most expensive in the long run for it throws back on the Government the expense of practically all experimental design. If private initiative were to be allowed an opportunity to bear this burden with a prospect of adequate rewards in the form of production orders, the competition would attract engineering talent which is now at work in other fields.

It might be imagined that this paragraph is merely the result of a failure to realise how comparatively little remunerative business the British Aircraft Industry actually enjoys, but as a matter of fact the American manufacturer is undoubtedly in a weaker position in many ways than is his British confrere.

Both the Army and the Naval Air Services maintain actual design staffs, which compete with the manufacturers' own drawing offices, and in quite a number of cases machines of official design have been ordered from the Aircraft Industry. In many other cases machines to the makers' own design have been ordered in purely experimental batches, and after trial and sometimes modification by the Government department concerned, tenders for the supply of a proprietary design have been invited from all and sundry. It seems generally to be the case that contracts for production of such machines go to firms other than those who were responsible for the design.

Under the circumstances it will be seen that the American designer of aircraft is not unduly encouraged. The United States Army Engineering Division at McCook Field seems in fact to be attempting to set up a monopoly in the design of military aircraft much as the Royal Aircraft Factory did in this country before and during the beginning of the War. The attempt if successful can only seriously retard progress in aircraft development in America, but it is likely to break down for the same reasons as did the R.A.F.'s attempt.

In the meantime the British Aircraft Constructor may at least congratulate himself on having passed through this particular development of the official control mania.

SINGAPORE AND THE OIL SUPPLY.—(Part IV.)

By C. G. GREY.

Sea Traffic Problems.

It is also necessary to consider the problems of the existing Persian oil fields round about Maidan and Naftoun, whence the pipe-line runs to Basra, or rather to the oil port of Mohammerah on the opposite side of the river.

All the supplies of food, engineering material, and so forth for these fields have to come by ship through the Red Sea and round to the Persian Gulf. Consequently the outward-bound supply ships are as liable to attack as are the homeward-bound oil-tank steamers, not to mention the "returned empties" in each direction. This means of necessity strong seaplane patrols and escorts of aircraft-carriers all the way from Aden to Basra.

The Singapore Base may prevent a break-through into the Indian Ocean by the Japanese Fleet, but it cannot prevent commerce-raiders and submarines carrying aircraft from slipping through between the Malay Islands, or from circumnavigating Australia. When one considers how the German raider, the little *Wolf*, with her tiny seaplane the *Wolfchen*, got out of the North Sea, round Scotland, down the African Coast, round the Cape of Good Hope and up into the Indian Ocean, where she laid mines off Bombay and Aden, and captured ships off the East African Coast and flew the *Wolfchen* over the Australian Harbours and got safely back to Germany again in spite of the whole British Navy one begins to realise what a good seaman with a plucky crew can do on lone-hand raids. And the Japanese are not lacking in pluck. They lack originality of idea as a rule, but they can always follow a good example.

It is hardly likely that ships of the *Wolf* class will be used as commerce-raiders by the Japanese, for they would be too easily seen and caught by aircraft patrols. The Japanese will probably use submarines specially built to carry aircraft

It should be remembered that early in the War 1914-18 Mr. Pemberton-Billing, then controlling the Supermarine Aviation Works at Southampton, actually designed special flying-boats to pack when folded into special compartments on the decks of the small submarines of the period. His idea was to send a flotilla of such craft into the Baltic and thence bomb Berlin, which is only 200 miles from the coast. Of course the scheme was turned down by the Admiralty, but it was perfectly workable.

Since 1918 the U.S. Navy has actually built small float-seaplanes to carry in submarines and has modified a submarine experimentally to carry and work with the seaplanes. The idea is that the seaplane shall be brought on to the deck, its wings put on by special quick-attachment gadgets and that the submarine shall submerge leaving the seaplane afloat. The seaplane will act as a scout for the submarine and will signal to it by wireless the whereabouts of any ships which look like fair game.

Naturally the little seaplane scout has a range of vision and a radius of quick action far beyond that of a submarine. And the big submarine of to-day, carrying a 12-inch gun besides her torpedoes, is far more than a match for any merchant ship and is quite capable of tackling a destroyer so long as the destroyer does not spot her first and shell her before she can emerge fully and bring her big gun into action. So the submarine will have excellent eyes in the small seaplane both to spot her victims and to guard her against surprise attack by surface war-ships.

All of which means that the destroyer patrols must themselves be supported by aircraft patrols whose duty it will be to spot, chase and destroy the small seaplanes from the raiding submarines and to spot the submarines themselves so that they can be destroyed either by aircraft bombs, or by shell-fire or depth-charges from the destroyers.

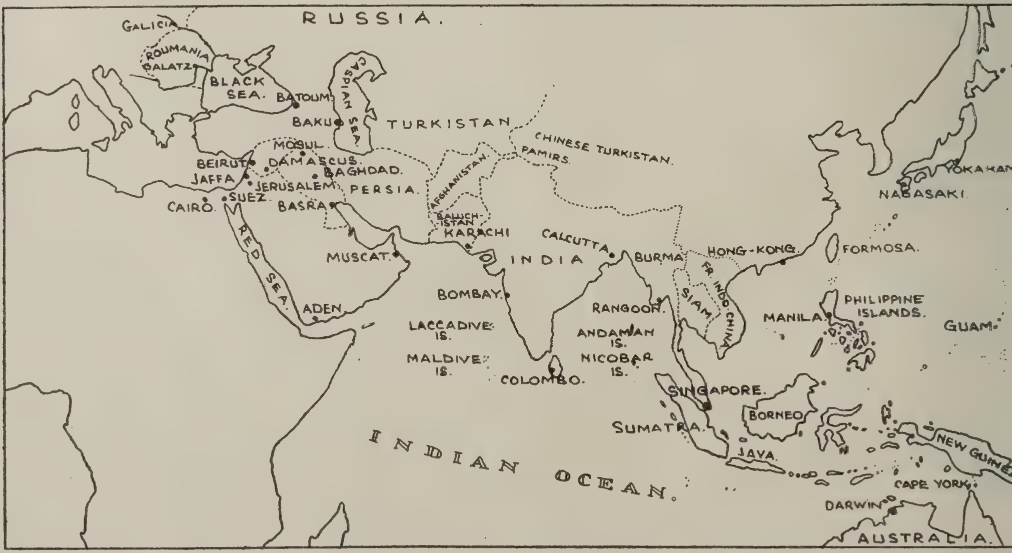
Thus it may be seen that aircraft enter more than ever into the scheme of things. The destroyer patrols would be blind and useless without them and the raiding submarines would be easy victims without their own air scouts.—Which recalls the fact that during the War 1914-18 at one period in the Mediterranean every convoy which tried to get through with only destroyer escorts lost at least one ship and generally more, whereas the convoys which used aircraft escorts, if only a kite-balloon tied to a tramp steamer, were never even attacked, for the good reason that submarines on the surface at a distance saw the aircraft against the sky, and concluded that as they themselves would be seen if they came any closer they had better not attack.

The Strategy of the Indian Ocean.

The Japanese commerce raiders would not, of course, confine their attacks to the Persian Gulf oil and supply steamers. Though these would be their principal objective, for the good reason that every one sunk would affect directly the motive power of the British Fighting Services, there would be plenty of good game besides.

First of all there would be the merchant ships to Singapore itself, carrying food supplies and armament——one heard during the War 1914-18 of a perfectly good passenger-liner taking some hundreds of tons of trinitrotoluol out to Egypt with women and children in the cabins on top of it. Then there would be all the supply ships to our Northern Australian and East Indian fighting bases. And then there would be all the ordinary ships with trade goods for India, Ceylon, the Malay States and Burma. So the guns and torpedoes of the Japanese submarines would not lack targets.

By the time the war begins we shall probably have made India a free and independent chaos, as we have done with Ireland. Having "educated" the Dravidian Hindoo and the Semitic Moslem to believe that they can govern themselves we shall ultimately be compelled to leave them to it (as the Midland phrase has it). Within a year the Pathans



THE STRATEGY OF SINGAPORE.—A map showing the chief localities affected by the Singapore base.

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Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Bri anicos.

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of the North West will be on the loot well down into the Valley of the Ganges; the Nordic Punjabis will have murdered or ejected all the Dravidian scum which now clutters up their country; the great independent princes of Central and Northern India will be at war with one another (most of them have the objectives and staff work of their wars arranged, docketed and pigeon-holed already), and through, over, round, and in and out of the lot there will range hordes of Indian cavalry (chiefly *silladar* cavalry) disbanded by the Government and re-banded by their own British officers into the most highly organised and efficient co-operative looting societies ever imagined (the general management of this has also been arranged quite ready for immediate use).

After a year or so of this the "politically-minded native"—Mr. Montague's particular protégé—will probably be sorry he spoke. The babu may be a great man in debate but Hurree Chaunder Mookerji is not the man to stand up to a Pathan or a Punjabi with a sword-hilt in his fist.

But there will still be a good deal of trade to be done with India and Ceylon, just as there was still trade doing with revolutionary France from 1789 to 1796, and with revolutionary Russia from 1917 onwards, and with revolutionary Ireland in 1920-22. And so there will be a considerable number of ordinary merchant ships as victims for Japanese commerce-raiders, besides the ships carrying actual war-supplies.

To protect all this shipping we shall need a vast number of seaplane patrol bases besides our main base at Singapore. For the protection of the Red Sea—Persian Gulf traffic we shall want a biggish base at Aden at the mouth of the Red Sea and another at Muscat at the mouth of the Persian Gulf. We shall want a big one in Ceylon, probably at Colombo, with subsidiary stations in the Laccadive Islands and the Maldive Islands to the West and the Nicobar Islands to the East (all on the direct line from the Red Sea to Singapore). And the Dutch will provide bases in Sumatra and Java, provided that the Japanese do not capture the whole of these islands at the start of the war.

To complete the chain we shall need a first class base in North Australia. This should be, one imagines, at Port Darwin, where there is a decent harbour.

From that point the patrols will control the 200 mile passage to Timor, the last of the bigger Dutch East Indian Islands. And there should presumably be a subsidiary station at Cape York to patrol the narrow and dangerous Torres Strait between Australia and New Guinea, where the shipping comes through from the Indian Ocean to the East Coast of Australia and to New Zealand outside the Great Barrier Reef.

Also Australia will have to provide patrols for her own coasts to watch for submarines slipping round by Tasmania to the Southern Indian Ocean. Such raiders could do considerable damage to South African shipping and vessels going round the Cape instead of through the Suez Canal.

So far as Australia itself is concerned there is little fear of a serious Japanese invasion during the war, because the Japanese Navy will have its hands full in the East Indies. But the Australians know very well that if we lose the war it will be good-bye to White Australia. And so it is up to the Australian Government to make some sort of a start on the Port Darwin base as soon as possible, without waiting for any official talk of war.

It was stated officially in 1923 that the Australian Government is making a substantial contribution towards the cost of the Singapore base, obviously because of the Japanese menace to Australia. Also it may be remembered that in 1922 the Australian Air Force ordered a number of seaplanes in England as the beginning of a coast-defence force against Japanese agression

One stated in print at the time that Australia's best and cheapest defence in fact the only defence financially possible for Australia, was a big force of coastal aircraft, and the Australians themselves agreed fully. Unfortunately, owing to political considerations the original scheme has been shelved and Australia's marine air defence (in fact all her air force) has been utterly neglected. This has not been the fault of what is now the Royal Australian Air Force. It is purely an affair of politicians. Consequently it may be assumed that when the menace of war in the Far East becomes a little clearer an Australian statesman will overcome the mere politicians and will put Australia's air defences on a proper footing.

If the present Government of Australia is so far-sighted as to see the benefit of contributing to the cost of the Singapore Base it ought not to be difficult to show that same Government the equally pressing need for establishing bases on a much smaller scale at Port Darwin and Cape York.

Undoubtedly when the war begins there will be raids on Australian ports, much like the "tip-and-run" raids which German warships made on Yarmouth and Scarborough and Hartlepool during the War 1914-18. The object of such raids may be merely to scare the Australians into keeping their men and ships and aircraft at home, and thus to prevent them from being sent up to the North to help on the Singapore-Port Darwin defence line. Or they may be intended definitely to sink shipping in Australian harbours and to damage the harbours themselves. But there can be no big invasion of Australia by the Japanese unless and until Japan wins the war in the East Indies and obtains permanent possession of the Dutch East Indian oil-fields.

It is as certain that this can never happen as it was certain in 1914 that Germany could never conquer the whole of France so long as England was fighting on the French side. But there is always a possibility of a temporary Japanese success which would allow enough time for the Japanese to land troops in Queensland or New South Wales and become actively unpleasant. And there is always the possibility that an effete Europe might make peace with the Yellow Races on such terms as would give Japan a free hand to negotiate with a lonely Australia an arrangement by which Japanese immigrants should have the right to settle permanently in Australia. And that would mean the extinction of White Australia just as effectively as if Japan were to conquer the whole country.

AUSTRALIA'S WAY.

For those reasons it behoves the Australian people and the Australian Government to begin now the building and organising of a coast defence force of aircraft and carrier-ships which will be at least as valuable in the sea and air war in the Far East as were the Australian Imperial Forces in France and Palestine and Mesopotamia during the War 1914-18. Such an Australian force added to our own and the Dutch and the American forces in the Indian Ocean and in the East Indies would be of high value.

There is no finer air pilot or fighting man than the native-born Australian, the descendant of horse-riding and adventurous ancestors. We shall need him in the Great War, and it is to be hoped that those who govern him to-day will take such a course as will make his task the less difficult when he is called upon not merely to defend Australia or to fight for the British Empire but to save the White Races from extinction by the Yellow Race.

None know better than do the Australians the precise significance of the Colour Line. It gives a greater cause for which to fight than does personal loyalty to a King or the patriotic enthusiasm inspired by nationality. The Colour Line is the distinction between race and race. Man or woman may be forgiven any unfaithfulness except faithlessness to the race to which they were born. And there is little fear of any Australian forgetting the Colour Line. For which reason, when these matters come to be fully understood, we Europeans may depend on Australia's uttermost help in the Great War.

(To be continued.)

The Secretary of State for Air.

It was officially announced on Feb. 4 that the King has been pleased to approve that the dignity of a Barony of the United Kingdom be conferred upon Brigadier-General the Right Hon. C. B. Thomson, Secretary of State for Air.

Sir Samuel Hoare.

On leaving the Air Ministry, Sir Samuel Hoare, Air Minister in the late Cabinet, addressed the following message to his late colleagues at the Air Ministry:—

I desire to express my thanks to all with whose work I have been brought into contact and for the ready assistance which they have at all times afforded me. I have been much struck during my term of office with the zeal and *esprit de corps* which animate all ranks of the Royal Air Force and with the very high standard of discipline and efficiency which have been attained by this the youngest of the fighting Services. The Royal Air Force has a brilliant future before it and is destined to play a *rôle* of steadily increasing importance in Imperial defence. Civil aviation, too, is, I am confident, on the threshold of far-reaching developments. I am proud to have been associated with the Air Ministry during a year marked by such progress as has been made, thanks to the unremitting efforts of all concerned, in 1923.

R.A.F. and the Civil Power in Iraq.

The following statement was issued by the Colonial Office on Jan. 31: —

(1) The bombing by aircraft in Iraq which has been the subject of recent Press comments occurred last year.

(2) The bombing was considered necessary by the High Commissioner to preserve peace. It was not undertaken, as alleged, because taxes were in arrears, and it would be contrary to specific instructions to bomb for any such purpose.

(3) The whole question of the employment of aircraft in Iraq in support of the civil authorities is being considered afresh by His Majesty's Government.

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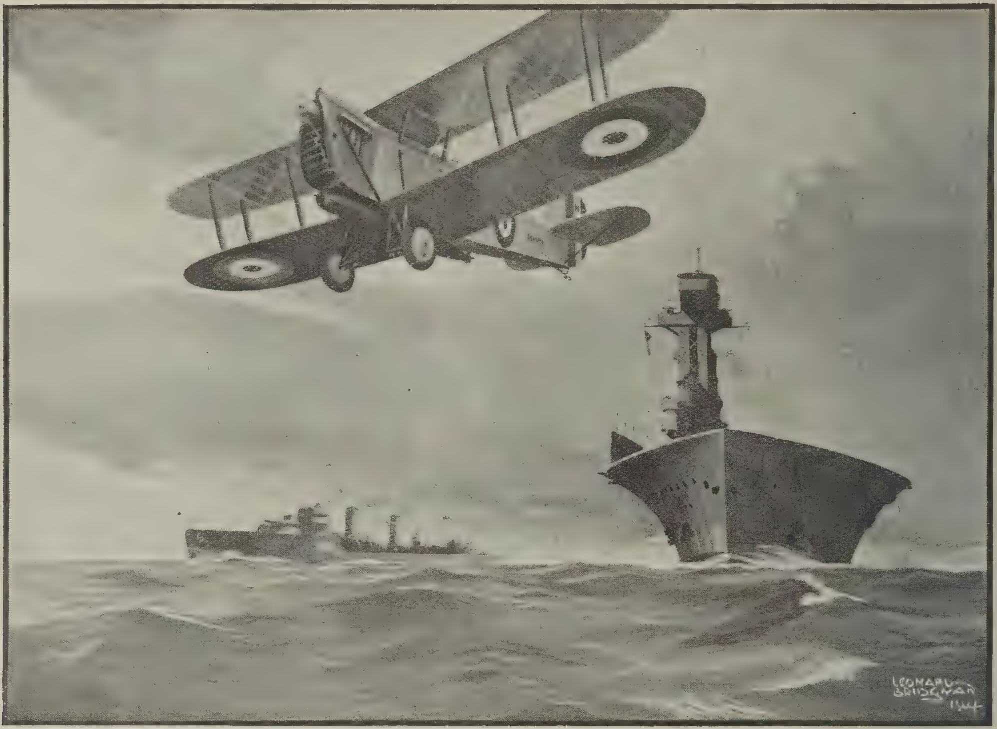

DESTROYERS.—An impression by Mr. Leonard Bridgman of a Blackburn Dart (450 h.p. Napier Lion) flying off the deck of H.M.S. Hermes. The Dart carries a crew of one, a special light-weight 18 in. torpedo and has a top speed of 96 knots. The T.B.D. in the background is of the "Modified W" type, carries a crew of 120, six 21 in. torpedo tubes and has a maximum speed of 35 knots. The Hermes, which goes into commission this week, carries 20-30 aeroplanes or seaplanes and has a maximum speed of 25 knots.

The New R.A.F. Appointments.

The new Royal Air Force appointments announced on Saturday are of some considerable interest. The Palestine Command which has previously been under the command of Major-General Sir Henry Tudor, who, as he was under Air Ministry orders, was appointed a Temporary Air Vice-Marshal, is succeeded by a regular R.A.F. officer, Air Commodore E. L. Gerrard. The Inland Area at home, previously an Air Vice-Marshal's command, is now to be under Air Commodore Webb-Bowen. Air Commodore Halahan's appointment to the Supply and Research Department appears to indicate that later he will take over one of the two directorates to be formed in that Department.

The Beaumont Cup.

Great Britain is to be represented this year by the Gloucestershire Aircraft Company in the race for the Beaumont Cup, which will take place at Istres, near Marseilles, on June 22. The Royal Aero Club has lodged the entry with the Aero Club de France.

It is understood that Mr. H. P. Folland has designed a new machine for the event, which will have a Napier Lion or Lioness engine. Mr. Folland has recently been making tests with wing sections similar to those used by the American speed machines and no doubt hopes to attain similar speeds to those reached in America. Wing radiators will probably be used. Mr. Larry Carter will pilot the machine in France.

Another machine with British interests entered for the race is the Gourdou-Leseure monoplane fitted with a British built Bristol Jupiter engine.

The Gordon Bennett Race.

The balloon race for the Gordon Bennett Trophy, which was last won by Belgium, will start from Brussels again this year. The date has now been fixed definitely for Sunday, June 15.

New York West Indies.

On Jan. 21 the Aeromarine all-metal flying boat *Morro Castle II* left New York for Porto Rico and other islands in the Caribbean Sea and by the time it is due back at New York in May the boat will have flown 12,000 miles.

The pilot, Mr. C. J. Zimmerman, is accompanied by Col. R. L. Streeter, Vice-President of the United States Aluminium Co., the manufacturers of the alloy used in the hull construction, F. A. Thompson, special correspondent of *The Outlook*, E. Jessup associate-editor of *Field and Stream*, W. D. Hamilton in charge of aerial photography for Underwood and Underwood and S. F. Walton, mechanic.

Although only launched last June, the boat already holds the record of being the first single-engined Liberty-engined boat to carry 3,445 lbs of useful load and also to carry seven passengers to 13,050 feet.

The all-metal hull weighs 100 lbs. lighter than a wooden hull of similar displacement and is fitted with six water-tight bulkheads, any two of which are sufficient to keep it afloat.

After being in the water for three months carrying over 1,000 passengers and flying over 10,400 miles, the wing-tip floats were perfectly dry and only some rainwater was found in the hull.

The flying-boat is to join the United States Atlantic Fleet in the battle manœuvres in southern waters.

The United States Light Aeroplane Race.

It is announced that among the events at the meeting at Dayton, Ohio, in additon to the Pulitzer Trophy and other events for full-powered aircraft, there will be an event for light aeroplanes—or "aerial gliders," as the local phrase has it.

More United States Records.

On Oct. 25 the Barling Bomber (six 400 h.p. Liberty engines) piloted by Lieuts. H. Harris and M. Fairchild reached an altitude of 6,800 ft. and made a speed of 95.5 m.p.h. carrying a load of 2,000 kilograms. On Oct. 27 carrying a load of 3,000 kgs. the machine reached an altitude of 5,000 ft. Both of these flights were witnessed by official representatives of the F.A.I. and are claimed as World's Records for weight-lifting.

The only previous record for carrying 2,000 kgs. useful load appears under Class C (seaplanes) and was made by Lieut. H. E. Holland U.S.N. who on June 7, 1923, reached a height of 1,489 m. (4,884 feet) on an F.5.L. flying boat (two 400 h.p Liberty engines). No records for anything above 1,500 kgs. have been promulgated for land machines.

The total load of the Barling Bomber when she took off

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on the latter flight was 37,435 lbs. An attempt is to be made to establish a record carrying 4,000 kgs. of useful load.

The Loss of the Dixmude.

A new High Commission has been appointed, with Marshal Fayolle as president and the rest of the Commission being composed of Vice-Admirals to inquire further into the loss of the *Dixmude*. This High Commission has been formed in order that it may have sufficient seniority to suggest punishment, if any, for matters which may be brought to light in connection with the last flight of the lost airship.

A French Light Aeroplane Competition.

The Association Française Aérienne who in the past two years have organised the French gliding meetings at the Combegrasse and Vauville are organising for 1924 an international competition for light aeroplanes. This competition, which will be known as the *Tour de France des Avionettes*, will be under the patronage of the Under-Secretary of State for Aeronautics, M. Laurent Eynac, and will take place in August over a circuit of 2,500 kms. (1,562.5 miles). The competition will be run in stages, the winner of the Tour de France being the machine which covers the whole circuit in the least time.

The cubic capacity for single-seaters has been limited to 2,000 c.c. and for two-seaters 3,000 c.c. and in addition a fuel-consumption test will form an eliminatory contest.

Various notable prizes are being put up and it is expected that entries from France, Great Britain, Belgium and Holland will participate.

M. Pescara's Successes.

On Jan. 30, at Issy-les-Moulineaux (ever the home of the ridiculed but mostly finally successful) M. Pescara made a further attempt to complete a circular flight of one kilometre (.621 of a mile) in his helicopter. The machine is the one which he has used on his more recent flights.

He performed the outward flight of 500 metres (546.8 yds.) in 7 mins. 23.4-5 secs. and accomplished the turn in 19.1-5 secs. After covering 250 metres on the return journey the helicopter, which was maintaining a height of about three feet, got a slight bump and touched the ground. The whole 750 metres occupied 10 mins. 10 secs. M. Pescara continued the flight and completed the kilometre, though he is not eligible for the prize offered for an uninterrupted flight of one kilometre by a helicopter.

This is by far the longest flight yet made by a helicopter.

New Belgian Air Companies.

In the past few weeks two new aviation companies have been formed in Belgium. The first is known as the S.O.C.T.A. or Société Colombophile de Transports Aériens, the object of which is to transport racing pigeons to localities in France or neighbouring countries from whence they can fly back to Belgium for the pigeon races which are so much in favour in Belgium. The President of the new company, which has a capital of about 1,000,000 francs (about £10,000), is M. Jules Jaussens, President of the Fédération des Sociétés Colombophiles, which in Belgium alone had a membership of 350,000.

To give an idea of the importance of the transport of pigeons in Belgium, it is known that 30 million pigeons are sent to France annually for racing purposes, and the advantage of sending them by air instead of by rail is considerable. In the first place the speed of transport by air is such that the birds are caged for a comparatively short time, and the cost of transport and the feeding of the birds is reduced to a minimum.

Similarly, the conditions for flying are eminently suitable for pigeon racing. Weather conditions, wireless weather reports from the releasing aerodrome and the suitability of aerodromes for this purpose as compared to railway sidings where the birds are liable to damage from wires, other trains, etc., are all arguments in favour of air transport.

During the past year a Junkers monoplane was specially fitted up for the transport of pigeons and operated with success by M. Chairdron, and the experience gained from this venture has prompted the formation of the new company.

The other new company is the C.A.B. or Compagnie Aérienne Belge the purpose of which is to organise aerial photography and aerial survey work in general in Belgium and the Belgian Congo. The President of the C.A.B. is M. Fernand Jacobs, President of the Belgian Aero Club.

Italian Aircraft Carrier.

On Dec. 20, the *Giuseppe Miraglia*, first Italian naval aircraft-carrier was launched with much patriotic ceremony at Spezzia.

Apparently the *Giuseppe Miraglia* is a converted steamer of 4,500 tons displacement with a speed of 22 knots. Sheds for the accommodation of nine aeroplanes, and workshops are built as superstructure, there being a small flying-off deck but apparently no flying-on deck. It is expected that the ship will go into commission early this summer.

A U.S. Height Record Attempt.

On Dec. 7 Lieut. J. A. Macready, U.S.A.S., made an attempt to regain the World's Height Record but he was compelled to land after reaching an indicated height of 37,000 feet owing to supercharger failure.

He was using the Lepere biplane, on which Lieut. Schroeder and Lieut. Macready have made previous height records. It is fitted with a 400 h.p. Liberty engine and a new Moss-General Electric Co. supercharger.

The supercharger worked perfectly up to 10,000 feet, but above that height considerable variation in the amount of supercharging took place. Finally at 37,000 feet which was reached in 49 mins. the supercharger failed altogether and the engine revolutions dropped to 300 per minute. It was found on landing that the front-end thrust bearing of the supercharger was badly burned and had apparently been frozen, this undoubtedly causing fluctuations and finally failure.

A further attempt is to be made in the near future.

Spanish Records.

On Dec. 14 1923 Lieut. Escribano of the Spanish Army flying a Fokker D.XI (300 h.p. Hispano-Suiza engine) beat the Spanish height record, reaching a height of 8,869 metres (29,090 feet) with a full load amounting to 400 kgs. (882 lbs.) On Dec. 17 the same pilot on the same machine beat the Spanish speed record of 262 kms. (163.75 miles) per hour, under official observation.

The machine used is one of a batch of Fokker D.XI single-seater scouts recently delivered to the Spanish Army and except for the fact that the machine guns were not fitted, it was perfectly standard and had not been specially tuned up for the above tests.

An Esthonian Air Line.

In 1922 an air traffic company was formed at Reval, in Esthonia, known as the Aeronaut Transport Co., for the purpose of running an air line between Reval and Helsingfors.

The line was started with one Sablatnig 5-seater limousine monoplane (200 h.p. Benz engine) the pilot being a German, Herr Max Limbach.

Since then further machines built in Esthonia under license have been added, a shed built, various mechanics and ground staff taken on and two extra pilots of Esthonian nationality engaged. The company then went more or less bankrupt, the German pilot left, but the two Esthonian pilots carried on, ensuring a regular service to Helingsfors during the time the sea was impassable owing to ice. An attempt to run a Riga-Reval service was seriously handicapped owing to the unreliability of the Maybach engines used.

In the autumn of 1923 a German mechanic arrived to instruct the Esthonian mechanics in the care and maintenance of Maybach engines, but he did not meet with much success.

Then two Junkers seaplanes and two German pilots and a mechanic arrived and they carried on successfully with the Reval-Helsingfors line.

The Aeronaut Co. then went bankrupt and they could not even pay their pilots and mechanics. The Esthonian pilots' pay amounted to 6,000 Esthonian marks per month, plus 1½ marks per km. flown (1,600 Esthonian marks to the £). Test flights and unfinished flights were not counted for flying pay. The German pilots received double the above amount with the same flying pay. The Esthonian Government then lent the Company 5 million Esthonian marks, and for less than a month the firm carried on. It was then rumoured that the Aeronaut Co. became a branch of the Junkers Co., which rumour has since been proved to be correct.

Since last Christmas no flights have been carried out, the two Junkers seaplanes having been sent to Königsberg to be reconditioned and overhauled.

During 1923, 841 flights were made by the company, of which 362 were joy rides, 236 flights were on the Reval-Helsingfors service, and 93 on the Reval-Riga service. The total number of passengers carried was 1,873, number of kms. flown 67,375, with a total of 561.18 hours' flying time. Of the percentage of regularity 96 per cent. flights were finished successfully, 1.4 per cent. were unfinished owing to forced landings, engine failure, etc., and 2.6 per cent. were cancelled owing to bad weather, etc.

It is expected that the line will be re-opened early this year as a new branch of the powerful Junkers Co. who seem, in spite of restrictions, to be successfully operating air lines in every part of the world.

Aircraft for Persia.

The Persian Government have purchased six French aircraft and these have now arrived at Bushire. Several French pilots who are to act as instructors to the Persian Army accompanied the machines. As the Persian Government has engaged three Germans to organise the arsenal a certain liveliness is expected in Persian Gardens.

A Height Record in the Argentine.

On Jan. 23 a Fokker C.IV biplane broke the World's altitude record carrying 500 kgs. (1,100 lbs.) by reaching a height of 6,485 metres (21,227 feet) at La Plata, the Argentine Republic.

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Saturday Review, 1/9/23.

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THE ROYAL AIR FORCE.

London Gazette.

Jan. 29.

General Duties Branch.—V. Harris is granted a perm. commn. as a Plt. Off., with effect from (Jan. 14), and with seny. of July 14, 1922.

The follg. are granted S.S. commns. in the ranks stated, and with seny., of Jan. 14:—Flg. Offs. (for Seven Years on the Active List): L. S. Hamilton (Capt., Indian Army, retd.); A. B. Smith, M.C., (Capt., Indian Army, retd.). Plt. Offs. on Probation (for Five Years on Active List): L W. G. Annable, E. C. Boucher, R. W. E. Bryant, S. E Bulloch, J E. Clayton, R. K. Coupland, P. Cranswick, M.C., H. T. R. Cripps, E. H. Fielden, T. H. Finney, L. R. Gladwin-Errington, G. D. Green, P P. Grey, G. S. Hall, A. F. Hutton, G. W. P. Irwin, G. H. Jennings-Bramly, A. J. McKellar, J. C. Marcy, D. W. J. Meagher, F. W. Moxham, J F. Nicholas, P. E. Nicholl E. H. L. Pellew, D. Robinson, G. W. R. Russell, A. E. P. Smith, V. W. Soltau, C. F. Steventon, J. Summers, W. A. Tattersall, G. D. Venables, F F. Wilkinson, and J. F. Young.

Flt. Lt. F. G. C. Weare, M.C., resigns his permanent commn. and is permitted to retain his rank (Jan. 20). Flt. Lt. M. H. Coote is placed on half pay, scale B (Jan. 1).

Stores Branch.—Flt. Lt. A. R. Thomas is restored to full pay from half-pay (Nov. 21, 1923) (substituted for the notification in the *Gazette* of Nov. 30, 1923).

Medical Branch.—Flt. Lt. C. T O'Neill, O.B.E., M.B., is granted the acting rank of Sqdn. Ldr. from Oct. 21, 1922, to Sept. 26, 1923, inclusive.

Reserve of Air Force Officers.—Flg. Off. L. Rimmer, M.M., is confirmed in rank (Jan. 12).

Appointments.

Week ending Feb. 4.

General Duties Branch.—Air Commodores T. I Webb-Bowen, C.B., C.M.G., to Inland Area to command, 10/3; L. E. O. Charlton, C.B., C.M.G., D.S.O., to No. 3 Group, Spittlegate, to comman,d 7/3; C. L. Lambe, C.B., C.M.G., D.S.O., M.V.O., to Air Ministry (Dept. of Air Member for Supply and Research), 1/4; C. R. Samson C.M.G., D.S.O., A.F.C., to No. 1 Group, Kenley, to command 26/2; E. L. Gerrard, C.M.G., D.S.O., to Palestine Command, to command, 1/4.

General Duties Branch.—Squadron Leader S. R. Watkins, A.F.C., to H.Q., Coastal Area, 1/2.

Squadron Leaders H. V. C. de Crespigny, M.C., D.F.C., to School of T.T. (Men), Manston, 17/2; C. R. Cox, A.F.C., to Air Ministry, 11/2; C. W. Nutting, O.B.E., D.S.C., to R.A.F. Depot on transfer to Home Estab., 10/1; H. I. Hanmer, D.F.C., to No. 1 School of T.T. (Boys), Halton, 11/2; A. W. C. V. Parr, to Superintendent of Reserves, Northolt, 11/2; L. H. Slatter, O.B.E., D.S.C., D.F.C., to R.A.F. Base, Malta, 26/1; F. H. Unwin, O.B.E., to R.A.F. Depot on transfer to Home Estab., 10/1.

Flight Lieutenants R.S. Sorley, D.S.C., D.F.C., and S. D. Culley, D.S.O., both to R.A.F. Depot, on transfer to Home Estab., 10/1; H. N. Hampton, D.F.C., to R.A.F. Depot, on transfer to Home Estab., 23/12; T. L. G. Pynches, to Aeroplane Exper. Estab., Martlesham Heath, 7/2; L. G. le B. Croke, to R.A.F. Base, Gosport, 28/1; C. E. V. Porter, R. Harrison, D.F.C., and J. Lawson, to R.A.F. Depot, on transfer to Home Estab.; R. T. B. Houghton, A.F.C., to R.A.F. Depot, on transfer to Home Estab.; F. W. Trott, O.B.E, M.C., to No. 24 Sqdn., Kenley, 4/2; E. A. Fawcus, to No. 1 School of T.T. (Boys), Halton, 1/2; J. B. P. Angel, to Inland Area Aircraft Depot, Henlow, 6/2.

Flight Lieutenants H. A. J. Wilson, O.B.E., to H.Q., Mediterranean, 23/12; F. Thomasson, D.F.C., M.M., to No. 2 F.T.S., Duxford, 19/1; A. P. V. Daly, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab, 30/12; L. A. K. Butt, to Armament and Gunnery School, Eastchurch, on transfer to Home Estab., 10/1; E. H. Hooper, to R.A.F. Depot pending disposal on transfer to Home Estab., 30/12.

Flying Officers M. W Nolan, to School of T.T. (Men), Manston, 4/2; J. R. Bell, D.F.C., J. Duncan and R. Menzies, to R.A.F. Depot on transfer to Home Estab., 10/1; W. G. Kentfield, J. C. Dunbar, H. H. S. Scott, D.S.M., and G. W. Birkinshaw, to R.A.F. Depot on transfer to Home Estab., 20/12; A. E. Woodbridge, B. T. Hood, E. H. Rundle, E. H. Searle, and F. R. Eason, to R.A.F. Depot, on transfer to Home Estab., 10/1.

Flying Officers W. Sanderson, A.F.C., to R.A.F. Depot, pending disposal on transfer to Home Estab., 8/1; H. F. Luck, J. A. Stedman, C D. Robertson, M.M., P. W. Adams and T. J. Shaw, to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab., 30/12; M. H. Aten, D.F.C., to No. 12 Sqdn., Northolt, on transfer to Home Estab., 23/12; T. W. Shortridge, to School of Army Co-operation, Old Sarum, on transfer to Home Estab., 23/12; M. J. Du Cray, to R.A.F., Depot, on appointment to a S.S. Commn., 23/1; J. C. Stevens, to R.A.F. Base, Malta (No. 481 Flight), 23/12; G. N. Coward, to No. 1 F.T.S., Netheravon, 14/1.

Pilot Officer F. E. Nuttall, to No 4 Sqdn., Sth. Farnborough, 1/2.

Pilot Officers E. Reid, to No. 111 Sqdn., Duxford, 1/2; R. G. Rickman, to No. 24 Sqdn., Kenley, 1/2; A. G. Everett, to No. 24 Sqdn., Kenley, on transfer to Home Estab., 10/1.

Medical Branch.—Flight Lieutenants (Medical) C. P. Barber and B. F. Haythornthwaite, M.B., B.A., to Aircraft Depot, India, 28/12; C A. Lindup, to No. 27 Sqdn., India, 28/12; J. J. Clarke, to Research Laboratory and M.O.S. of I., Hampstead, on appointment to a S.S. Commn. for short course, 28/1.

Flying Officers (Medical) S. G. Gilmore and T. Glynn, M.B., to Research Laboratory and M.O.S. of I., Hampstead, on appointment to S.S. Commns. for short course, 23/1.

Store and Accountant Branch.—Squadron Leader (Stores) W. J. Shields, to R.A.F. Depot, on transfer to Home Estab., 23/12. Flight Lieutenant (Stores) M. J. James, M.B.E., to R.A.F. Depot, on transfer to Home Estab., 10/1; G. A. Curtiss, to No. 3 Group H.Q., Spittlegate, 11/2; A. W. Turner, to No. 100 Sqdn., Spittlegate, 1/2; A. E. Sutton-Jones, to No. 3 Stores Depot, Milton, 4/2. Flying Officers (Stores) F. A. Skoulding, to R.A.F. Depot, on transfer to Home Estab., 30/12; E. F. Elliott, to R.A.F. Depot, on transfer to Home Estab., 10/1; F W. Taylor, to No. 12 Sqdn., Northolt, 18/2; G. W. Sturman, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab., 30/12.

Store and Accountant Branch.—Flying Officers (Stores) H. N. Stevens, to R.A.F. Depot (Non-effective Pool), 30/12; W. B. Frederick, to R.A.F. Depot (Non-effective Pool), 10/1.

Medical Branch.—Flight Lieutenants (Medical) J. Prendergast, M.B, B.A., to Stores Depot, Iraq, 18/2, instead of to No. 84 Sqdn., as previously notified: E. G. Howell, to R.A.F Depot, 30/1.

Chaplains' Branch.—The Rev. M. H. Edwards, M.A., to R.A.F. Base, Calshot, on transfer to Home Estab., 10/1.

The Proposed Royal Naval Air Reserve.

In *The Times* of Jan. 28 there appeared a letter from Admiral Henry Campbell in regard to the possibility of forming a Royal Naval Air Reserve on the lines of the Royal Naval Reserve modified scheme which was adopted by the Admiralty in 1912.

Admiral Campbell's proposals are roughly, as follows:—

Airmen operating from ships must be trained from a class that is accustomed to sea life and must have a profession to which to return when their service is completed, as comparatively few could be retained professionally in the Air Service

The navigating instruments and the method of navigating for sea and air craft could be made very similar.

The terse, particular and descriptive language of the sea, and the knowledge of ships, charts, landfalls and figuration are peculiar to seamen.

The training of mercantile marine officers for the air could be worked into the scheme of training young officers for the R.N.R., while still preserving the advantages which this system provides for the Royal Navy, the mercantile marine, and shipowners, from the points of view of efficiency and economy.

The mercantile marine training institutions are well suited to give the preliminary education to young officers who are desirous of passing through the Royal Naval Air Reserve as flying, observing, or mechanical officers.

Viscount Curzon in a letter to *The Times* on Jan. 30 said that he thought the idea was excellent but he did not see how it could be carried out unless the Admiralty were given control of its own air arm.

Mr. T. Scott, the Secretary of the Mercantile Marine Service Association approved of the scheme in a letter to *The Times* on Feb. 2, and wrote that the scheme had the support and commendation of the council of the Association who are themselves practical seamen.

A Memorial.

A memorial tablet to the late Lieut. A .A. McLeod, V.C., R.A.F., was unveiled in the Highlanders' Memorial Church, Glasgow, on Jan. 27, by Col. Sir John Lorne McLeod, ex-Lord Provost of Edinburgh.

A detachment of Royal Air Force from Leuchars under command of Flt. Lt. Mercer was present, and all the McLeods of the Highland Light Infantry and the Argyll and Sutherland Highlanders.

Lieut. McLeod won the V.C. when only 18 years of age and while serving with No. 2 Squadron, R.A.F. He was the son of Dr. Allan M. McLeod of Stonewall, Manitoba, Canada, and died in hospital at Winnipeg, Man., from an attack of influenza, accentuated by wounds received in action.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Rugby.

R.A.F. v. Devonport Services:—This match, which was played at Devonport on Feb. 2, resulted in a win for the Devonport Services by three tries (9 points) to a goal and a try (8 points). The R.A.F. showed excellent form in the first half, Flt. Lt. Bryson and Flg. Off. Howlett both scoring tries, one of which was converted by Flt. Lt. T. Lowe. In addition to the scoring the Air Force pack played a great game hindering their opponents at every turn by the quickness with which they broke up.

In the second half the Air Force were put on the defence and following a series of forward rushes the Services scored three tries.

The R.A.F. team were:—Cpl. Wale, back; Flg. Off. Howlett, Flt. Lt. Bryson, Sjt. Snaith, and Flg. Off. Forrest, three-quarter backs; Sqdn. Ldr. Russell and Flt. Lt. Medhurst, half-backs; AC. Hampton, Cpl. Johnson, AC. Collins, Flt. Lt. Lowe, Flg. Off. Isaacs, Flt. Lt. Chick, Flg. Off. Hancock, and Flg. Off. Wackett, forwards.

R.A.F. v. Exeter:—This match was played at Exeter on Feb. 4, the R.A.F. winning by four tries to nil. The following short description of the game is taken from *The Sportsman* with due acknowledgments.

Though their forwards were the heavier the Air Force backs did not see much of the ball in the opening half, and the only time they got really away was when C. N. Lowe, on the right, burst through. A knock-on, however, spoilt the opening and half-time came without score.

The Air Force forwards played hard on resuming, and at length Isaacs went over between the posts. This was followed by fierce Exeter attacks, which the visitors repelled, and later the Air Force went further ahead when Adams obtained a second try. Chick and

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Usher also crossed the Exeter line, but not one goal kick was successful.

Hockey.

GLENGORM CASTLE (R.A.F.) v. 2/5 MAHRATTA REGT :—

This match was between the 2/5 Mahratta Regiment and a team chosen from the R.A.F. personnel who left Iraq in the *Glengorm Castle* and was played at Karachi on Dec. 29, and ended in a draw. In spite of the Iraq team being a collection of individuals, and unaccustomed to playing on anything but baked mud, the match produced a very even game, both goals having narrow escapes in the second half. The R.A.F. had most of the game for the first twenty minutes, but the regiment scored first through a mêlée in front of goal. Five minutes later Sjt. Baker obtained the ball and tricked the goalkeeper with a push stroke. The scores were still level at half-time, after which the game became faster than in the first half. Both defences had plenty of work, and the Mahrattas had bad luck with a shot that missed the R.A.F. goal by inches. Just before the end one of the Air Force forwards missed the ball when standing about two yards in front of his opponents' goal-mouth, and so the match ended in a 1—1 draw.

R.A.F XI :—L-AC West (30 Sqdn). Flg Off Shortridge (30 Sqdn.), AC.1. Moon (S.D., Basrah), Sjt. Parker (A.H.Q.), Sjt. Davies (A.D., Hinaidi), L-AC. Jones (30 Sqdn.), Sjt. Cawthorn (A.H Q.), I-AC. Meech (55 Sqdn.), Sjt. Munk (S.D , Basrah), Flg. Off. Hampton (A.H.Q.), Sjt. Baker (30 Sqdn.).

R.A.F. Cranwell.

RUGBY FOOTBALL :—Cadets' Team : 1/12/23, v. Stoneygate, at Leicester, lost, 3—14; 8/12/23, v. Nottingham (Club), at Nottingham, lost, 6—22; 15/12/23, v. R.M.A., Woolwich, at Cranwell, lost 5—23.

Station Team : 1/12/23, v. Newark, at Cranwell, won, 23—0; 12/12/23, v. R.A F., Leuchars, at Cranwell (2nd Round R.A.F. Cup), won, 11—3; 14/12/23, v. R.A.F. Spittlegate, at Spittlegate (3rd Round R.A.F. Cup), Won, 8—3; 5/1/24, v. Newark, at Cranwell, lost, 8—32; 26/1/24, v. Sleaford at Cranwell, won, 27—0; 29/1/24, v. R.A.F., Spittlegate, at Cranwell, won 17—3.

ASSOCIATION FOOTBALL :—Station Team : 1/2/23, v. Retford, at Retford, lost, 3—9; 22/12/23, v. Grimsby Rovers, at Cranwell (5th Qualifying Round English Amateur Cup), won, 3—1; 5/1/24, v. Badsey Rangers, at Cranwell (1st Round Proper English Amateur Cup), won, 2—1; 12/1/24, v. Alfreton Town, at Cranwell, lost, 4—10; 19/1/24, v. Esh Winning, at Durham (2nd Round Proper English Amateur Cup), draw, 1—1; 26/1/24 v. Esh Winning, at Durham (2nd Round Proper English Amateur Cup), lost, 1—2; 30/1/24, v. R.A.F , Henloy, at Henlow (2nd Round R.A.F. Cup), won, 4—0

HOCKEY.—Cadets' Team : 30/1/24 v. Station Team, at Cranwell, won, 8—1.

Station Team : 1/12/23, v, Sleaford, at Sleaford, won, 7—1; 8/12/23, v. Peterborough, at Cranwell, lost, 2—3; 13/12/23, v. R.A.F., Uxbridge (2nd Round R.A.F. Cup), won, 4—3; 19/1/24, v. Sleaford, at Cranwell, lost, 2—3; 26/1/24, v. Boston, at Cranwell, lost, 0—1; 30/1/24, v. Cadets, at Cranwell. lost, 1—8.

Air Mails in 1923.

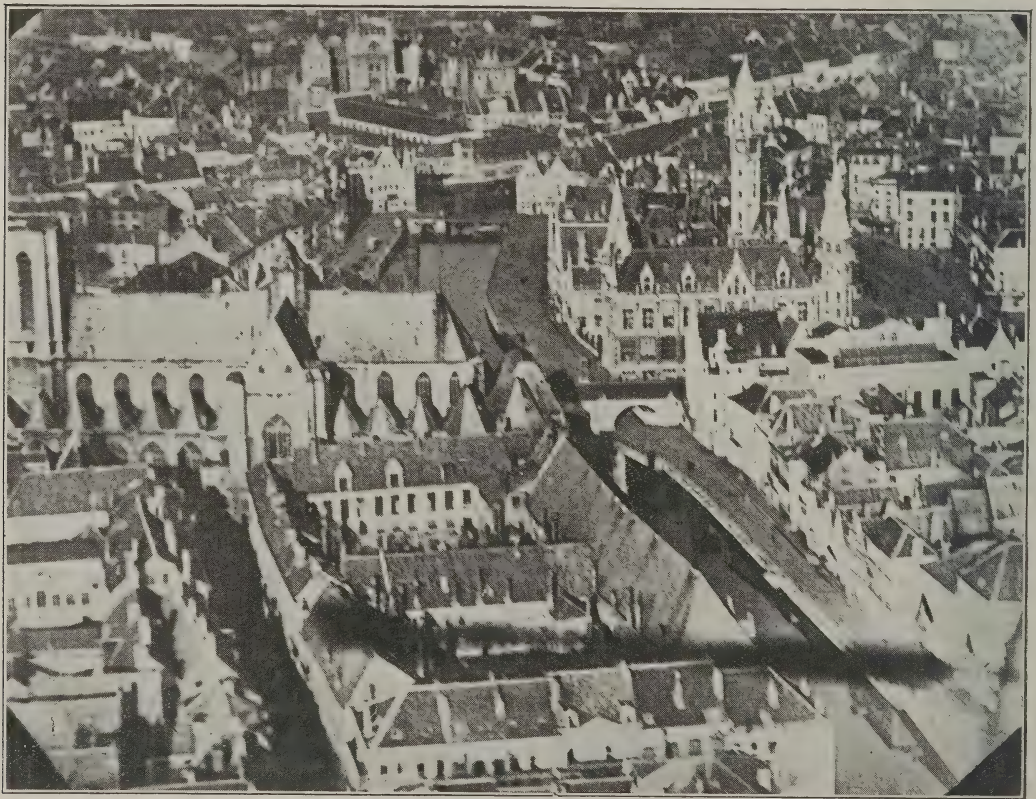
The Postmaster-General communicates the following particulars of Air Mail traffic during 1923 :—

The air letter traffic on the London-Paris servce remains small, the number of letters sent having been about 23,700, as against about 28,500 in 1922. On the other hand, the air letter traffic to and from Cologne has grown rapidly, from about 400 lb. during the first quarter of 1923 to over 4,000 lb. during the third quarter. This tenfold growth is largely to be attributed to the partial dislocation of the ordinary mail service with Cologne caused by present conditions on the Rhine. The total weight of the letter Air Mails to and from Cologne throughout the year was nearly 10,000 lb., representing some 142,000 letters. During the latter part of the year the weight of the inward Air Mail was over 4 times that of the outward. Air Mail letters to Holland increased from about 9,600 for $8\frac{1}{2}$ months of 1922 to about 22,000 in 1923, an increase at the rate of about $6\frac{1}{2}$ per cent.

The weight of parcels sent to Paris during 1923 by aeroplane amounted to about 23,700 lb. ($10\frac{1}{2}$ tons), as against about 18,700 lb. in 1922. The Air parcel traffic to Holland increased substantially during 1923, and amounted for the whole year to about 11,900 lb., as against about 5,200 lb. during 7 months of 1922.

About 315,000 letters in all are estimated to have been carried by the Cairo-Baghdad Air Mail in 1923, as against about 175,000 in 1922—an increase of 80 per cent.

The only non-British Air Mail service of which appreciable use is made by the public in this country is that from Toulouse to Casablanca (Morocco), for which about 17,000 letters were posted in 1923—an increase of about 85 per cent. over the number (9,200) posted in 1922. Growth during 1923 was steady, from about 3,600 letters in the first quarter to about 4,600 in the fourth.



IN OLD FLANDERS.—A photograph of Ghent taken from a British aeroplane.

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PRACTICE AND EXPERIMENT.

During the past few months the fact that the practical design of aircraft as of most other things is essentially a matter of judicious compromise between conflicting requirements, has been insisted upon in this paper on more than one occasion.

On the other hand, it has also been suggested that in the majority of cases experimental work may most usefully be carried on when freed as far as possible from the practical necessity of compromise, because only then will it be possible to discover with any accuracy how much the practical designer is really sacrificing in making any given concession to practical requirements.

The practical utility of any given aeroplane for any given purpose is governed by so large a number of factors that it is really beyond the capacity of the human mind to arrive at a useful estimate of the value of any type of such machine except by a step-by-step process of regarding each of its characteristics as largely independent of all the others. This step-by-step method is the best that one can use, but it requires to be used with very considerable discretion as a guide to the lines along which future developments and improvements may legitimately be sought. The consideration of one factor alone on the assumption that all the other factors are likely to be unaffected may lead to extremely unsafe deductions.

Light or Heavy Engines?

The point may be illustrated in connection with the problem of the development of a satisfactory engine for commercial aircraft. It is perfectly obvious that it would be possible to produce a very considerably more robust, reliable and less costly engine for commercial aeroplanes if one were permitted to increase the engine weight from two to say two and a-half lbs. per h.p. The proposal that commercial engines should be produced on the lines of increased robustness and weight has received a good deal of support in various quarters. But designers of aircraft and certain of those who are concerned with the technical direction of commercial air services agree that no increase in weight of existing engines can be tolerated.

In support of this attitude they point to the fact that the modern commercial aeroplane carries only 4 lbs. of paying load per h.p. of engine, that if the engine weight is increased by ½ lb. per h.p. the paying load is reduced to 3½ lbs. per h.p. and that such a reduction in the revenue earning capacity would have the most serious effect on the prospect of making civil air transport a paying business. Rather they urge that every possible method should be adopted to reduce the weight per h.p. of aero-engines in order that the revenue earning capacity of machines may be increased.

On these grounds certain eminent authorities have expressed their complete disbelief in any reasonably near future for the heavy oil type of aero-engine, because it seems that this type will inevitably be somewhat heavier than the petrol engine.

The argument as to the supreme value of light weight in aero-engines is sound in so far as it applies to aeroplanes such as are actually in service to-day, that is, aeroplanes which can carry only about four pounds of paying load per h.p. So long as the aeroplane remains as it is to-day there is very good reason for refusing to consider the use of heavier engines whatever advantages they may possess as engines, because they will spoil the aeroplane in which they are installed.

The Present and the Future.

But that does not necessarily imply that the experimental development of slightly, or even considerably, heavier types of engine, which promise increased reliability, economy, and cheapness, can have no practical value. It is necessary to consider whether an increase in weight which would be prohibitive in the case of existing machines will necessarily be prohibitive in machines which may be produced by the time that the new types of engine are fit for service.

If there is any likelihood that in a few years' time it will become possible to build commercial aircraft carrying 10 instead of 4 lbs. of paying load per h.p., a decrease of ½ lb. in the useful load may be a cheap price to pay for a more reliable and economical engine. Actually there is nothing at all improbable about the achievement of such a figure. At present the useful load of an aeroplane is a small proportion of the total—it is a small difference between the weight of the empty aeroplane and the total weight that that aeroplane will safely carry. With the present type of machine a saving of 10 per cent. in the machine weight means 30 per cent. increase in the pay load, so that comparatively small savings on the machine are represented by large increases in the useful duty of the machine. Under these circumstances great improvements in the commercial usefulness of aircraft as measured by the paying load per h.p. may reasonably be expected in the future. That being the case, there is legitimate reason to embark on the experimental development of heavy oil engines and the like despite the fact that such engines could not be usefully employed on existing aeroplanes.

The Future Aeroplane.

To estimate the utility of any such development it is necessary to estimate the effect of the sum total of probable development in the whole art of aeroplane design and construction. Any attempt to produce such an estimate must necessarily be highly speculative, but it is probably fairly safe to assume that at some time in the not far off future it will be possible to combine in one and the same machine two or more of the characteristic qualities which at present can be attained singly in a single machine.

For instance, it is certainly possible now to produce an aeroplane with an L/D of 15/1, but the structure weight of such a machine—unless it were very small—would be high. Mr. J. D. North in a recent paper claimed that it was possible to reduce the structure weight of quite a large aeroplane to 27 per cent. of the total loaded weight, but probably such a machine at present would have an L/D of 9. On this basis it woud not be unduly rash to predict that within a measureable time it will become possible to build commercial machines with an L/D of 15/1 and a structure weight percentage of 27 per cent.

Making a liberal allowance to permit of rapid take off and climb a machine with an L/D of 15 at a cruising speed of 100 m.p.h. would weigh about 22 lbs. per h.p. of engine installed, instead of the 16 lbs. per h.p. of the present type of machine. The structure weight would be 5.5 lbs. per h.p., leaving 16.5 lbs. per h.p. for power plant, fuel and disposable load.

The structure weight of the present 16 lbs. per h.p. type is also about 5.5 lbs. per h.p., but in this case it is about 35 per cent. of the total weight. The power plant weighs 3 lbs. and 3½ hours' fuel 2 lbs. per h.p. That is 10½ lbs. for bare aeroplane and fuel, leaving 5½ lbs. per h.p. for equipment and useful load. Crew and fittings account for the difference between this and the 4 lbs. of pay load actually achieved.

Assume that the weight per h.p. of power plant and fuel remains unaltered and the improved machine also weighs 10½ lbs. per h.p. with fuel but unfurnished. But it has the 11½ lbs. available for equipment, crew and useful load—more than twice the margin available in the present type. It would therefore be fairly safe to claim that it should carry 8 lbs. per h.p. instead of the present 4 lbs.

It is perfectly obvious that an increase in engine weight by ½ to 1 lb. per h.p. which would be intolerable in a machine carrying 4 lbs. of cargo per h.p., would assume quite a different aspect in the case of one which carried 8 lbs., and that to limit the scope of engine experiment by arguments based on present aircraft performances may prove to be extremely unwise, however sound may be the application of those arguments to the problem of choosing an engine for existing machines.

The Practical Man and Equipment.

What is true of engines is true of practically every other component or detail of the complete aeroplane, and it is certainly unsafe to predict from present experience that this or that development is unlikely to be of value because it cannot usefully be applied to any existing practicable aeroplane. Aircraft have suffered very considerably in the past from the influence of short-sighted arguments of this type, and are likely to suffer from them in the future. It is not only in aeronautics that this particular lack of vision operates. In practically every branch of human activity really useful inventions or developments are daily turned down by so-called practical men who fail to realise that the impossibilities of to-day are often the commonplaces of the day after tomorrow.

The practical man's advice as to whether one can usefully employ a given process or apparatus under existing conditions is often of the greatest possible value. His opinion as to whether the practicular process or appliance is worthy of experiment with a view to its use in the future is frequently useless and misleading.

For this reason it is very important that experimental work —particularly in so new a field as that of aeronautics—should be freed as far as possible from subjugation to the needs of the moment and that it should not be cribbed cabined and confined by the control of a Government Department which has any great concern with the production of immediately useful types.

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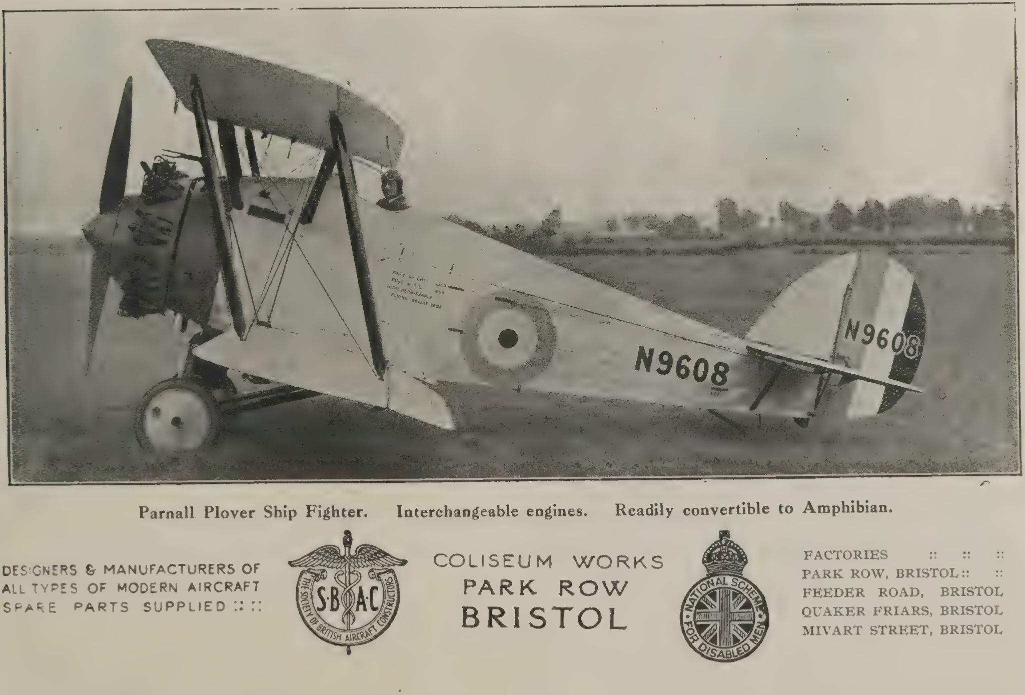

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THE DUKE OF SUTHERLAND AT THE CAMBRIDGE AERONAUTICAL SOCIETY.

The paper read by the Duke of Sutherland before the Cambridge University Aeronautical Society on Jan. 30 dealt with the subject of light aeroplanes and their development in this country and with the results of the writer's recent visit to America.

In regard to the first subject, the author expressed his personal belief in the future of light aircraft in this country, and his impression that the Air Ministry shared that belief and desired to help forward that development not only by the means of the competition which has already been announced, but by actively encouraging the establishment of light aeroplane clubs throughout the country. It must be regretted that recent events should have deprived the country of an Under-Secretary of State for Air holding these beliefs, but one may still hope that the present and future Under-Secretaries may share the Duke of Sutherland's attitude without becoming too solicitous for the regulation of the sporting side of aviation.

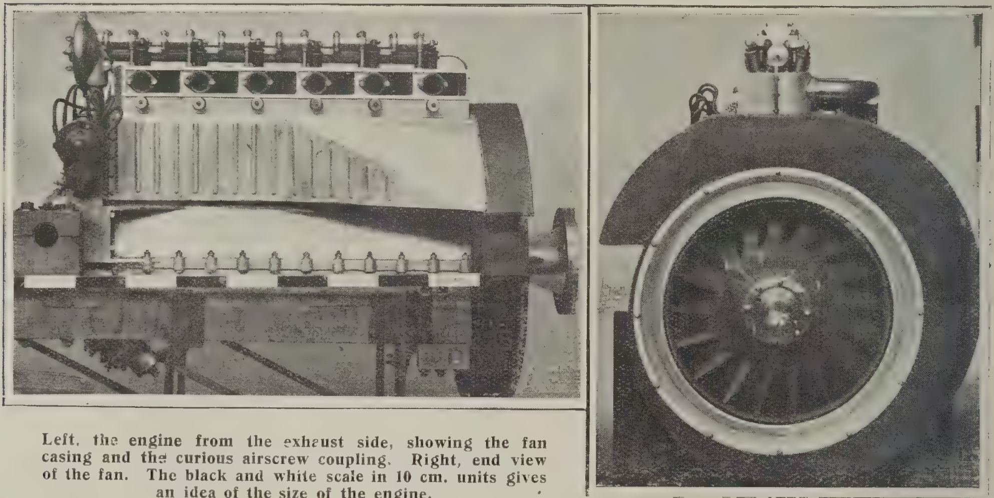
In so far as America is concerned the author expresses his great admiration for recent American developments in the matter of engines and high-speed aeroplanes, for the skill and courage of American Service pilots, and for the work of the U.S. Air Mail service.

In regard to this last he gave a rough outline of the landing and night navigation organisation which is now being prepared with a view to carrying on the Air Mail service during the night. At present the mails are carried by air through the day and are forwarded by train during the ensuing night and then if necessary picked up again by air. The night air mail will, it is claimed, make it possible to transmit letters from New York to San Francisco in 30 hours instead of in 80 hours by air and train and 100 hours by train alone.

In addition, the Duke mentioned the Winslow Bill for the constitution of a Bureau of Aeronautics under the Department of Commerce which it is expected will come before Congress and become law in the near future. This Bill provides for the regulation of Civilian Aviation along lines similar to those embodied in the International Air Navigation Regulations and is generally considered as being likely considerably to hasten the progress of commercial aviation in the United States.

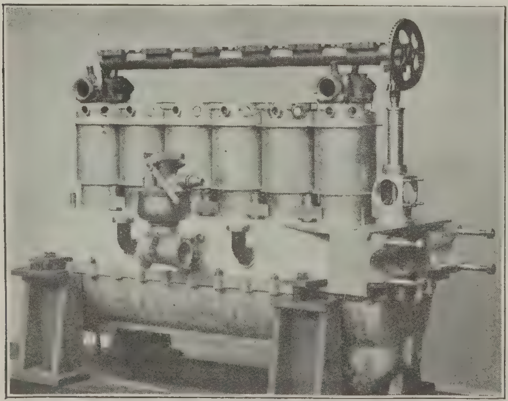
As is the case with most British visitors to the States, the Duke of Sutherland speaks extremely highly of the courteous reception accorded to him by all those whom he encountered, and particularly comments on the willingness of the American officials and aircraft manufacturers to show him all that they had worth seeing.

THE JUNKERS AIR-COOLED ENGINE.



Left, the engine from the exhaust side, showing the fan casing and the curious airscrew coupling. Right, end view of the fan. The black and white scale in 10 cm. units gives an idea of the size of the engine.

The photographs reproduced on this page give a good general idea of the Junkers L.1 air-cooled engine of 70/90 h.p. which is now being used in certain of the smaller Junkers machines. In arrangement the engine is of the standard German six-cylinder vertical type, with overhead camshaft.



The L.1 engine partly erected, from the intake side.

The special feature is the air-cooling system carried out by means of a centrifugal fan on the airscrew end of the crankshaft which delivers air into a cylinder casing of light sheet metal—somewhat on the lines of the old air-cooled Renault aero-engines, and of certain recent American car engines. Apparently it has not been found necessary to fit fins to the cylinder barrels themselves, and even more surprising is the fact that no very special precautions seem to have been taken to cool the cylinder heads. The cooling air outlets appear to be alongside the exhaust ports, which must help appreciably in the cooling of the head, but it seems probable that the engine is relatively large for its output and does not call for very great care in cooling.

Apparently the L.1 engine is intended rather as a cheap and serviceable power plant for small and relatively low-performance aircraft of fairly high efficiency, and it has been considered expedient to sacrifice engine weight and efficiency to simplicity of construction.

As can be seen in the photographs detachable cylinder heads, which should simplify overhaul, are fitted. An interesting feature is the provision at the gear end of fittings to take a tubular cross-beam from which to support the engine. The crank case is sufficiently stiff to allow the engine to be supported from this bearer and from the front of the crank case without fore and aft beams.

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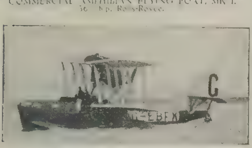

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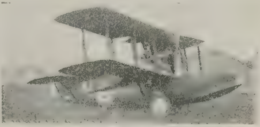

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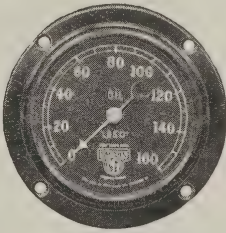

In days gone by it was generally supposed that a Pressure Gauge must be built with at least 6 in. or 8 in. dials. The dial of the Smith Gauge is only 2½ in. including fixed ring, yet it reads any pressure from 5 to 160 lbs. per square inch and overload. Full details of all models sent free on request.

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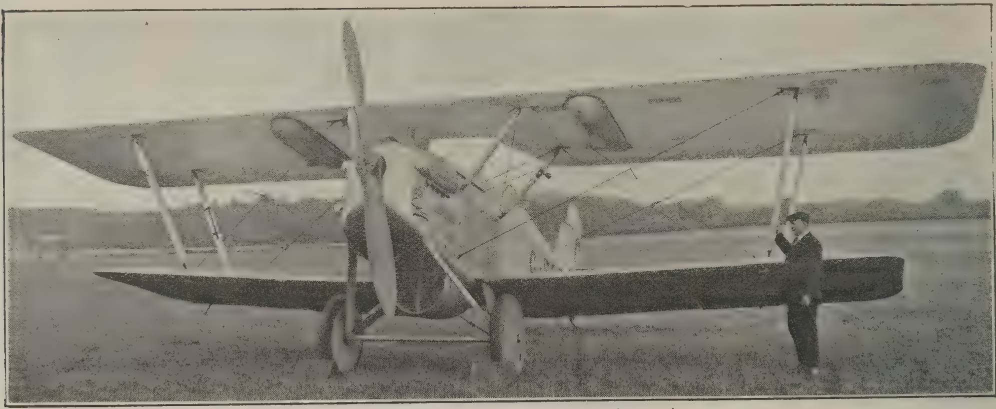


The Vickers Vixen (450 h.p. Napier Engine.)

A New Battery for Aircraft.

Now that aircraft carry wireless and electric lighting outfits accumulators are added to the sources of trouble which are liable to be met with in aerial operations. Thanks very largely to the brutal abuse to which the average motorist subjects the whole of his vehicle the manufacturers of accumulators have been forced to produce accumulators that are reasonably reliable and fool-proof, and aircraft lighting and wireless batteries have profited by the forced development of the motor-car type of accumulator.

The standard type of lead sulphuric acid battery now used for such purposes is compared with the lead cell of 10 or 15 years ago a surprisingly robust and reliable appliance. Neverthless it is far from being an ideal aircraft component. It is heavy, it is reliable only if the abuse to which it is subjected is kept within certain narrow limits, it is fragile, and the acid electrolyte is likely to do serious damage if it is spilt, as it is extremely likely to be in an accident.

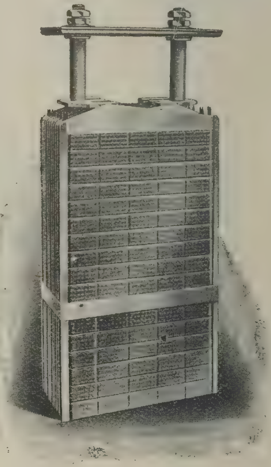
There has been developed within the past 20 years a type of accumulator in which the electrodes are of iron and nickel and in which the electrolyte is an alkaline solution. This type of battery has numerous very great advantages.

The electrodes are mechanically much stronger than any possible lead plate. The electrolyte does not attack steel and steel containers can be used for the cells instead of glass, celluloid or vulcanite. The electrolyte does not gas during discharge so that cells can be sealed up and there is no risk of leakage through vents. Owing to the mechanical strength of the plates the batteries will stand up to the most brutal treatement, both mechanical and electrical. Short circuiting an iron-nickel cell does it no harm whatever—in fact the treatment is recommended as an occasional tonic for batteries that have been out of service for some time.

The iron-nickel battery may be left for indefinite periods either charged or discharged without damage, can be charged at almost any rate without damage—in fact it seems to like all those forms of ill use which are fatal to the lead-acid type.

With these many advantages it may appear surprising that the nickel-iron accumulator has not long ago displaced the standard lead cell. The reason for its failure to do so may be traced to two causes. In the first place, the average working voltage of the new type is about 1.2 volts per cell as against 2 volts for the lead type, and secondly, in the early forms the internal resistance of the iron battery was very much higher than that of a lead cell of equal capacity. To obtain the same maximum discharge rate at the same voltage therefore the new type of battery required more cells of a greater ultimate capacity, and the lead battery for the same service was actually lighter, occupied less space and was cheaper in first cost.

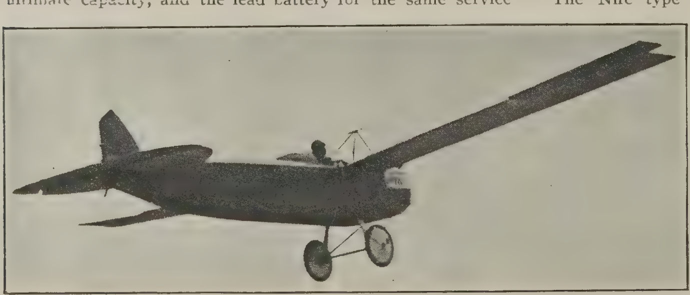
In the Nife iron-nickel accumulator which has been used for some years in Sweden these particular disadvantages of the type have been overcome by a special form of construction which makes the cells both robust and compact. The plates are of thin steel strips which enclose the working material, and the plates are welded to steel bridge pieces. The positive and negative plates are separated by Para rubber strips and are pressed tightly into welded steel containers. As a result the internal resistance of the cell is low, a battery of such cells is lighter and takes up less space than the equivalent lead battery.



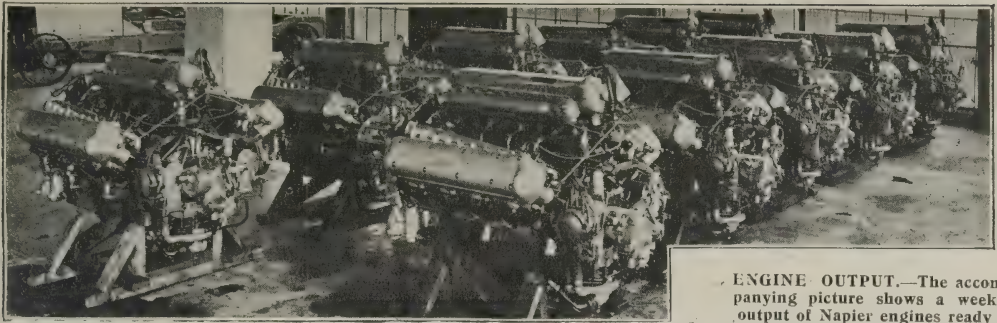
The active element of the Nife battery which is of steel strip welded to the bridge pieces, and consequently much stronger than any lead-plate assembly.

Another point in favour of this type of battery is the fact that its output is only very slightly affected by low temperatures. The lead cell becomes almost useless at really low temperatures, the iron-nickel type even when frozen solid gives practically full output.

The Nife type of battery is now being made in this country, and the distribution of the type for the London district is in the hands of Chas. McNiel & Co., of 199, Piccadilly.



A BELGIAN LIGHT AEROPLANE, designed by M. Cambier of the S.A.B.C.A. The machine is quite a normal braced monoplane; span 10.2 m. (32 ft. 6 in.) length 6 m. (19 ft. 8 in.) area 13 sq. m. (140 sq. ft.), weight loaded 275 kg. (605 lbs.). The engine is a Sergant of 780 c.c. and 16 h.p. and the machine has a maximum speed of about 100 km. (62 miles) per hour.



ENGINE OUTPUT.—The accompanying picture shows a week's output of Napier engines ready to undergo their acceptance tests before delivery. The 450 h.p. Napier Lion engine has now proved its reliability and efficiency to such an extent that it is in use in every country where aviation is taken seriously. In addition to the British Government the Governments of America, France, Spain, Japan, Canada, Holland, Argentine, Czecho-Slovakia and other countries all have Napier engines in use giving the greatest satisfaction.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 12; Tuesday, 3; Wednesday, 0; Thursday, 8; Friday, 14; Saturday, 14; Sunday, 7.

London—Paris—Zurich :
Handley Page Transport, Ltd., machines 9, passengers 49, freight 6,419 lbs.

London—Ostend—Cologne :
Instone Air Line, Ltd., machines 18, passengers 31, freight 18,204 lbs.

Manchester—London—Rotterdam—Amsterdam—Hanover—Berlin :
Daimler Airway, machines 12, passengers 2.

Paris—London :
Air Union, machines 13, passengers 20, freight 7,481 lbs

London—Rotterdam :
K.L.M., machines 6, passengers 10.

Special Machines : 0.

Total number of trips by British machines : 39, carrying 82 pas. Foreign machines : 19, carrying 30 passengers.

Comparative Figures :
For week ending Feb. 3 :
Machines, 58; Passengers, 112; Crews, 89; Total personnel, 201.
Corresponding week, 1923 :
Machines, 29; Passengers, 52; Crews, 61; Total personnel, 113.
Corresponding week, 1922 :
Machines, 22; Passengers, 42; Crews, 33; Total personnel, 75.
Corresponding week, 1921 :
Machines, 13; Passengers, 8; Crews, 14; Total personnel, 22.

Croydon Notes.

There has been a slight increase in the number of passengers travelling by air this week. For the first time this year the total for the week exceeded 100. Neverthless the bulk of the great British public will doubtless, like Felix, "keep on walking" unless some form of advertising campaign is organised in which the public are informed (a) that there are such things as Air Lines (b) that these Air Lines run regularly to definite places with a high percentage of regularity (c) that Air travel is safe.

Mrs. Oliver Atkey who has been flying a D.H.9 at Croydon lately, flew to Lympne during the week and on to Paris on Saturday. This is the first occasion on which a British woman pilot has flown from London to Paris and it is certainly the first time that a modern high-powered aeroplane has been used for such an event.

On the Aircraft Disposal Company's side of the aerodrome Lt.-Col J. L. Travers has been doing some straights on Major Cooper's monoplane, of which he was the co-designer. The machine, which takes off at a remarkably low speed, will be on circuits as soon as a fine day and Major Cooper arrive simultaneously.

Mr. Perry has been out doing height tests with a Tinsyde.

The Peculiar People.

A contract has been placed with M. Comte, Director of the Dubendore Flying School, Switzerland, for the construction of two seaplanes of his own design and for overhauling of a series of Fokker and Hanriot single-seater fighting aeroplanes which have been purchased by the Chinese War Minister. The Fokker and Hanriot machines are evidently Swiss disposals stock, which were originally German and Italian ex-war stock.

One wonders who will claim the credit if a French designed, Italian built, Swiss reconditioned, Chinese aeroplane flown by anything but a Chinese pilot breaks a record, or someone's neck, in Manchuria.

PERSONAL NOTICES.

Deaths.

CATZ.—On Dec. 17, 1923, at Abu Sueir, Egypt, Joseph Catz, Pilot Officer, R.A.F.

HUGH-JONES.—On Feb. 2, at Risalpur, India, as the result of a flying accident, David Jasper Hugh-Jones, Flg. Off., No. 27 Squadron, R.A.F., aged 26.

[According to *The Times* own correspondent Mr. Jones had landed four miles from Risalpur to make a minor adjustment and in taking off again hit a tree. The machine was wrecked and caught fire. Cpl. Hall, the passenger, was injured.]

Engagement.

LAURENCE—RAWLINSON.—The marriage of Flt. Lt. Frederic Hope Laurence, M.C., R.A.F., younger son of Mr. and Mrs. Gerard Laurence, of Corrie Wood, Letchworth, Herts, and Marjorie Vera, only surviving child of Mr J. B. Rawlinson Graythwaite Old Hall, Ulverston, Lancs, and Mrs Rawlinson, 35, South Street, Park Lane, W., will take place in Bombay in February.

Satisfaction,

British Wright Co., Ltd.—Satisfaction in full on Aug. 25, 1922, of debentures dated April 7 and May 5, 1913, securing £400.

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SENIOR DRAUGHTSMAN with aircraft experience required. Give full particulars and enclose references to The Blackburn Aeroplane and Motor Co., Ltd., Brough, E. Yorks.

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PUBLICATIONS.

THE MOST BEAUTIFUL of War Books is Capt. Saundby's "Flying Colours." Edition de luxe, £2 2s. Popular edition, 15s. **The copies remaining of the Edition de luxe are now offered at 15s. each, those of the Popular edition 5s. 6d. each, post free.—THE AEROPLANE, 14, Bream's Buildings, E.C.4**

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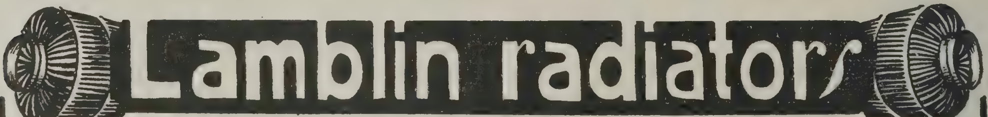

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Edited by C.G.Grey

Vol. XXVI. No. 7. SIXPENCE WEEKLY. Registered at the G.P.O. as a Newspaper.

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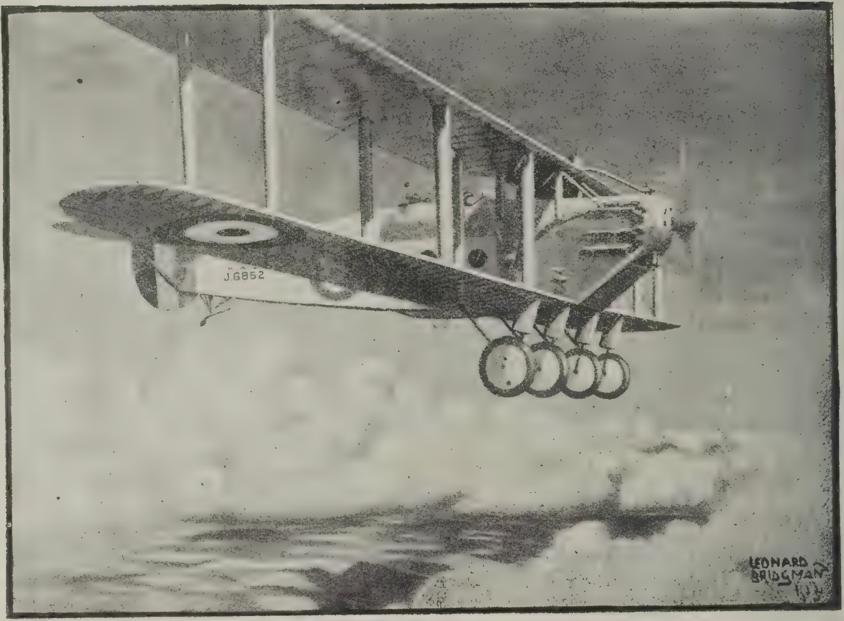

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ON AIR MAILS.

On another page a brief summary is given of an Interim Report issued by the Air Mails Committee embodied by the last Government. The committee states not only that no very great success has attended the mail sections of the British commercial air lines but that no improvement in a degree sufficient to turn a loss into a profit is likely. And the reasons given are adequate. It has been usual in aeronautical circles to assume that lack of initiative on the part of the public coupled with the continued use of rolls of red tape by the Post Office are the reasons why failure has attended all efforts to bring profit to the operation of air lines. A regular service has been maintained, the news sheets have been filled with stories of "record" flights in high winds or through fogs yet the public still regard aerial travel as a great adventure and the air mail as a means of amusing children who collect envelopes marked with strange inscriptions. The business man has not been induced to alter his ways. Yet the true explanation is that the existing British air routes operating in Europe are too short to give a sufficiently superior service over that of the normal route to make the use of the aerial mail an essential part of efficient commercial practice. Proof of the accuracy of this explanation is to be found in the record of the Toulouse-Casablanca air route which last year carried 3,000,000 letters of which 17,000 came from London despatched by these very business men who are supposed to be confirmedly anachronistic in their views and their actions. They have in fact realised that the gain to them by the use of that particular service is so great as to justify the slight extra risk of non-delivery or delay. When in due course, as announced in to-day's issue of THE AEROPLANE, the Toulouse-Casablanca route is extended to Dakar, it is will be possible to save nine days in the transmission of letters to Rio de Janeiro and South America, the increase in the mass of correspondence sent by air mail will be great.

With this in mind it is surely obvious that those who direct British aerial services should study communications on a very large map, spend rather less time on the consideration of internal services, cease unnecessary competition with efficient sea and land routes, and endeavour either to link up with such Continental air lines as connect with centres so far from London that great saving of time in transit can be made by the use of aircraft, or to organise and operate such long distance services themselves. We may, even though British, learn a little from foreigners, and we can with advantage adopt their ideas if not their methods.

When an adequate network of British air routes has been organised in Europe there are still vast tracts of the Empire which the skill and experience of the British air line personnel could cover with means of communication and transport which world not only be of Imperial value in the highest sense but would be in an economical sense remunerative to its founders.

It must not be forgotten that the prosperity of the Empire depends largely on the efficiency of the Imperial defence system. In no way can this system be so rapidly improved as by an increase in aerial communication. Even in commercial plans strategical considerations should be taken into account.

ON THE GOVERNMENT'S AIR POLICY.

On another page in this paper there will be found the gist of the statements made by the Secretary of State for Air to the representatives of a number of general and technical newspapers. In granting facilities for a meeting of this type at so early a stage in his administration, the new Air Minister was naturally forced to be exceedingly non-committal in his statements, and as will be realised from the report of the meeting he was able to do little more than to suggest that the Air Policy of the new Government was unlikely to be marked by any violent departure from that which was followed by their predecessors in power, and that the development of aviation would receive both sympathy and encouragement from the new Government, though naturally enough under the circumstances promises of encouragement in a form involving an increased expenditure on the part of the Air Ministry were avoided with care.

So far as the actual statements made by the Air Minister go, they amount to little more than an encouragement for hope of a reasonable continuity in Air Policy on the part of the new Government.

The meeting, however, provided an opportunity, which otherwise might have been postponed for some considerable time, of meeting the new Minister in the flesh and of acquiring an impression of his personality. That impression, it is pleasant to record, is an extremely hopeful one. Lord Thomson has the air of being not only an unusually able individual, but of being definitely of the type which commands the respect and willing service of his subordinates. He is obviously keenly interested in the affairs of his department and is possessed of a keen faith in the future of aviation.

Also whatever may be the political attitude of the Cabinet towards expenditure on military services, the Secretary of State for Air appears to have a due appreciation of the practical necessity under present conditions for adequate defensive forces in general and aerial defence forces in particular.

ON AIR MINISTRY RUMOURS.

Statements have appeared in the daily Press during the past few days to the effect that Lt.-Col. H. T. Tizard, A.F.C., was to be appointed as Director of Scientific Research at the Air Ministry as from Apr. 1 next.

It would be difficult indeed to think of a more suitable appointment to this particular post, and it is distinctly to be hoped that the statements in question are authentic. Unfortunately there is some reason to suppose that the statement is at the least premature, and that Col. Tizard has not yet seen his way to accept this particular position.

The accompanying prediction that the Directorate of Technical Equipment which comes into existence at the same time will be occupied by Air Commodore F. E. Halahan, C.M.G., C.B.E., D.S.O., M.V.O., has already been foreshadowed by his recent appointment to the Directorate of Supply and Research, and may be regarded as accurate.

Naturally the close coincidence of the reorganisation of the Department of Supply and Research with the advent to power of a new and untried Government and Air Minister has created conditions favourable to the propagation of rumours on this particular subject, but it is a hopeful sign that sufficient public interest exists in the matter of such technical appointments to lead the general Press to take cognisance of them.

The growth of such a public interest is a condition precedent to a realization of the importance of this part of the functions of the Air Ministry on the part of the political world, and must therefore be welcomed.

THE DISSOLUTION HONOURS.

In the list of Dissolution Honours conferred by His Majesty the King on the recommendation of Mr. Stanley Baldwin there are two creations which will give satisfaction to readers of this paper.

These are as follows :—

To be a Baron :

Sir John George Butcher, Bt., K.C., J.P.

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Sir Henry Herbert Hambling, Knight.

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Sir John Butcher will be remembered for his services in connection with the investigation of accidents inquiry. Sir John then signed a minority report which severely criticised the Royal Aircraft Factory.

Sir Herbert Hambling is chiefly known as the chairman of the committee whose findings resulted in the formation of the Imperial Air Transport Company of which he has been appointed a director on behalf of the Air Ministry.

SINGAPORE AND THE OIL SUPPLY.—(Part V.)

By C. G. GREY.

The Defence of Persia.

Having considered in a general way how the strategy of the Indian Ocean affects our supply of oil from Persia, and how important a part Australia must take in self-defence in the general strategy of the Far East we may now turn back to the immediate defence of the Persian oil-fields themselves.

One has shown how, apart from any question of the oil-fields in Iraq, none of which are as yet so far developed as to provide any considerable addition to the Persian supplies, we are compelled to hold Mosul in order to cover Baghdad against attacks from Turkey and the Kurdish Hills. And one has shown how we are compelled to hold Baghdad (A) to protect the projected oil pipe-line from Basrah to Jaffa against raids from the North and from interference by desert Arabs, and (B) to protect the Persian oil-fields against attacks from Kurdistan and the Caucasus by way of Tabriz, Hamadan and Kermanshah.

It is still necessary to consider the protection of these same oil-fields from attack from the North-East, that is to say from Turkestan and even from Afghanistan—if the Union of Soviet Republics achieves its present object and succeeds in dominating Northern Persia and the Afghan Kingdom. In this connection it is well to remember that it was by this road to the East of the Caspian that the present-day Turks came out of Turkestan and over-ran Semitic Persia, Assyria, Armenia, and Asia Minor with their Japhetic or Turanian hordes, and set up the mighty Turkish Empire which at one time extended to the gates of Vienna.

What has been done once can be done again, and if we become involved in a war with Russia before the advent of the true Muscovite Napoleon, it may well be that the young general who is ultimately to be the World-conqueror of our day will distinguish himself by his invasion of Persia from Turkestan over the famous rock-wall frontier, much as Napoleon distinguished himself in a similar side-show in 1796 when he crossed the Alps into Italy and chased the Austrians back across Lombardy when the main war area was to the North-East of France.

It may seem that Persian affairs have little enough to do with Singapore some few thousands of miles away, but in such a World-war as has been foreseen by many of our clearest thinkers the strategy of the whole war inter-relates and interlocks so closely that one nerve-centre of the war depends on another as much as the nerve-centres of the human body depend on one another.

If Singapore goes, or if our great base at Singapore fails to maintain the defence line along the Dutch East Indies to Australia, then our Persian oil supplies go with it because we shall be unable to ship our oil to Europe or supply the workers in Persia. And if our Persian oil-fields go then Singapore goes with them because we shall not have enough oil for our ships and aircraft operating along the East Indian defence line and in the Indian Ocean. Which may possibly be the end of the war. And that being so it is well to see what has been doing in Persia of late.

Russian Policy in the East.

For many years before the War 1914-18, when statesmen of foresight and wisdom directed our foreign policy, Russia was openly regarded as our greatest enemy in the Middle East. Russian strategic railways were laid from the Caspian eastward parallel to the Persian frontier with junctions communicating with Moscow and central Russia. At the eastern end of the main line spur lines were laid with rail-heads on the Afghan frontier and on the Northern limit of the Pamirs. These railways indicated Russian lines of advance direct into Persia and into Persia and India by way of Afghanistan, and into India through the Pamirs and Kashmir, as clearly as the German strategic railways to the frontiers of Belgium and Luxembourg indicated the German advance of 1914 into France by way of those countries.

Apart from the works of writers on military strategy and World Politics, which few people read, the Russian menace was frequently the theme of novelists and poets. Rudyard Kipling, brought up in North-Western India, has naturally a number of references to it, as for example in "The Truce of the Bear," "The Man who Was," and in "The Ballad of the King's Jest" with the line about "a grey-coat guard at the Helmund ford." It is found in A. E. W. Mason's "Broken Road," and very clearly indeed in John Buchan's "The Half-Hearted."

But all that was in the days of Imperial Russia, and pacifically inclined people regarded Anglo-Russian enmity as a legacy of the Crimean War of 1854. Not having the true race-sense or even an historical sense they could not realise that all these strategic movements were merely part of the race impulse of the Japhetic Muscovite towards World Conquest: an impulse which broke out and failed rather badly in his relative the Prussian, with his vast schemes in Europe and his "*drang nach Osten*," as exemplified in his policy towards Turkey and the unfinished Baghdad railway. The whole history of Russia since Russia became a nation under Peter the Great as distinct from a collection of Mongoloid hordes, has been one of unscrupulous conquest, without even the conscious-salving excuse of doing good to the aborigines which cloaks the building of the British Empire in some sort of decency.

With the break-up of Imperial Russia by the Bolshevist revolution and the formation of the Union of Soviet Republics—with which we are now entering into trade relations in 1924 exactly as we entered into trade relations with revolutionary France under the Directoire in 1796 (seven years in each case from the outbreak of the revolution)—short-sighted people imagined that Russia would become a nation or a collection of states run by ignorant workmen or peasants who would soon reduce it to chaos and impotence. They forgot, if they ever knew, that revolutionary France became within ten years Imperial France and began a career of conquest which for a while made the French Empire far greater than the Kingdom of France had ever been. And they likewise ignored the fact that a low-born dictator or self-made Emperor is far more ambitious and ruthless and reckless than is any hereditary monarch—on the good old principle, "Set a begger on horse-back and he will ride to the Devil." Which is what is happening and what is going to happen in Russia.

Soviet Development.

The Union of Soviet Republics, which for convenience we may call Russia, is following exactly the lines of the first French Republic: for the human mind, even allowing for racial differences, always works in the same way and, as one has often remarked, history is the greatest plagiarist in all literature. The Russian "terror" has subsided. Under Lenin and Trotsky—both purely Mongoloid, the latter being a Jew by religion only and not by race, a member of the Khazar tribe of pagan Tartars which adopted Judaism as a religion in the twelth century—something like order has been evolved. Lenin has died a natural death, unlike his prototype Robespierre who was guillotined. Trotsky appears to correspond to Barras, the French War Minister of the Directoire, under whom Bonaparte was offered and seized his opportunity.

Russia is now likely to be governed for a time by a Directorate of whom Tchicherin and Kameneff are the more prominent. Trotsky controls the Red Army, which is to-day the biggest and most strictly disciplined in the World, though as yet short of arms and mechanical equipment, especially heavy artillery and aircraft.

The supply of this mechanical equipment is now being organised by German engineers who have been driven into Russia by the misguided policy of the victors in the War 1914-18. This policy has been dictated during the past five years of devastating peace purely by French malice which has influenced the post-bellum acts of the former Allies exactly as a malicious woman influences the social existence of her unfortunate neighbours and relations, breaking up salutary attachments and forcing forward undesirable alliances.

Once more Russia is becoming a World Power and a menace to the peace not only of Europe but of the whole World. The Russo-Japanese *entente*, to which reference has already been made, is to-day very nearly as close as was the Anglo-French *entente cordiale* originated by King Edward VII of which we heard so much for several years before 1914. If the Great Race War should begin before German exiles have re-built Russia's armament factories it is probable that Japan will be able to supply initial deficiences, much as Japan supplied heavy artillery to Russia in 1914-18, and much as the French supplied us with aero-engines and aeroplanes in 1914-15, till we developed our own sources of supply.

The Russians in Persia.

At the moment we are considering particularly our Persian oil supplies in relation to Russian attacks from the North over the rock wall frontier of Turkestan, or from the coast of the Caspian Sea or from the North East by way of Afghanistan. To-day the situation is becoming acute because of the policy which Russia is pursuing in Persia.

Those who wish to grasp the situation from the geographical and ethnological point of view are recommended to read and re-read, if they have not already done so, Major Blacker's notable book *On Secret Patrol in High Asia*. It will give a better idea of the topography of the country and of the characteristics of the people—Russians, Turkomans, Pathans, Kurds and Persians alike—than will anything ever written which can be read in the same time and with the same entertainment. But for political information it is necessary to seek elsewhere, as the book was written some years ago.

So long as Russia could be regarded as a de-centralised

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collection of petty Soviet states each too small to be a danger to anybody we could regard with equanimity the eccentric vagaries of Bolshevist emissaries in Persia and Afghanistan. They might be wild-eyed philosophic anarchists of the type of Mr. Ghandi in India, or they might be political charlatans out to line their own pockets. In any case they could have no commercial or political or military weight behind them.

But the Soviet Republics of the Union to-day are under a centralised Government at Moscow which exercises at least as much direct control over political and military forces as does the Government of the United States in Washington. And it dictates direct action to a considerably greater extent because it is not hampered by a Congress or a Senate containing free and independent politicians who can speak their minds openly. And nowhere are its actions more direct than in relation to Foreign Policy.

Therefore there is the more interest in the information published in the *Morning Post* on Jan. 23 in an article by its correspondent in Teheran, the capital of Persia. This article should be of particular value to the officers of the Air Force in Iraq because of its military significance. They, being so near Persia, probably know nothing of what is doing there, on the principle of not being able to see the wood because of the trees. The article begins :—

> There is every indication that Russian policy in Persia is identical with that of the Tsarist *régime,* with the difference that the present day exponents are entirely unscrupulous and are more active than their predecessors. . . . The chief activities are directed towards the annihilation of British influence in order to leave the road open for Russian penetration. . . .
>
> A year ago the instruments of propaganda were the newspapers. This method has been abandoned as too crude, and a much more subtle and effective method has been adopted. This consists in a number of paid Persian agents, especially priests, who by means of meetings propagate their poisonous doctrines. . . . .
>
> The increase in Russian influence and prestige in Northern Persia during the last year has been remarkable and should occasion considerable uneasiness in London and India. Communism in Russia, as is well known, is as dead as a door nail, and there is no indication that to-day Russia has any idea of Bolshevising Persia. Her political aims are entirely national, not Bolshevist, and they will remain unchanged so long as there is any chance of her penetration to the Persian Gulf.
>
> The Soviet Government sent their first fully accredited Minister to Persia in 1921, Rothstein, a Russian Jew. Rothstein remained at Teheran for about one year, during which he did much to allay popular anxiety and dread of the extremist section of the Soviet Government. . . . .
>
> Rothstein was succeeded by the present holder of the post, Shumiatsky, who, though also a Jew, is a different sort of man altogether. . . . . He helped the Persian radicals to form the Socialist Party, and may be called the founder of that Party in Persia. He is considered a first-class propagandist. He is violent in his hatred of Great Britain and a great contrast to his more suave predecessor.
>
> The results of the recent political activities of the Russian agents comprise the following :
>
> (1) Russian troops stationed at Enzeli.
>
> (2) Fishery stations occupied by Russian sailors, and Persian officials turned out.
>
> (3) Appointment of Russian Consuls to places in the south of Persia, such as Ahwaz and Lingeh.
>
> (4) The maintenance of the 1903 tariff in the North, which is favourable to Russian goods, whereas the 1920 tariff, which is higher and unfavourable to British goods, is imposed in the South.
>
> (5) Negotiations for a new tariff more favourable still to Russia.
>
> Beyond this the Soviet Government is following the policy of the Tsarist Government by endeavouring to oust non-Russian trade from the North by allowing special customs drawbacks on Russian goods exported to Persia, such as sugar, petrol, and kerosene.
>
> The present Cabinet of Sardar Sepah was formed at the dictation of the Russian Legation, and includes Suleiman Mirza, the chief Russian spokesman, as Minister for Health and Education. . . . .
>
> A new banking institution has recently been instituted in Teheran, called the Russo-Persian Bank. . . . The object of the institution is to finance Russo-Persian trade. The long overdue exhibition of Persian national products is being completely swamped by the Russians, who are utilising to the fullest extent the opportunity of advertising their products, machinery, &c.
>
> There is no doubt that the Russians are pursuing their old policy of penetration, and that their double objective of the Persian Gulf and India is being constantly kept in view.
>
> The modern exponent of Russian policy is infinitely more active and capable than the former aristocratic diplomat, besides which he is a Jew, and derives further energy from purely Jewish nationalist sources. He is consequently much more dangerous.
>
> The Editor of the *Morning Post* adds :—[Note.—It will be remembered that Shumiatsky was one of the two Bolshevist emissaries abroad on whose recall the Marquess Curzon insisted in his correspondence with the Russian Soviet last year.]

Attack from the North.

There you have a fairly complete exposition of the situation in Persia, to-day.

Some readers may remember that in the days of Imperial Russia when a similar state of affairs prevailed the Russians actually formed regiments of Persian Cossacks under Russian officers, which regiments though nominally part of the Persian Army (a useless institution as a fighting force) were absolutely under Russian control and consisted of very fairly effective fighting men. No doubt the Red Army will in due course detail officers and men to Persia for similar duties and will thus establish in Persia nominally under Persian control the nucleus of a Russian force which will be capable of holding the country until regular Red Army troops arrive. And so long as that nucleus is nominally Persian it will be impossible for England to take any warlike action against them.

It would be possible for such troops to concentrate in the neighbourhood of our oil-fields ready to seize or destroy them on the declaration of war with Russia, but under international law it would not be possible for us to send troops or air force to protect those oil-fields unless our Government of the period had the sense to declare war on Persia on some trumped-up excuse or other before we had reached the point of war with Russia. And it is the possibility of just such a situation arising which makes it so important that we should concentrate at Basra, the Air Force station which is nearest to the oil-fields, sufficient strength of men and material to protect the oil supplies.

It is easier to move men than supplies, so even if the R.A.F. at Basra were under-manned it should always be kept thoroughly equipped with the most modern aircraft and armament. Being the base for the supply of all material for the R.A.F. in Iraq it is, of course, always full of technical stores, but the amount of these appears to be calculated on the basis of supplying Baghdad and Mosul than with the idea that Basra itself should be a base for operations by a fighting force. To equip and supply a fighting force at Basra would probably mean starving the forces further up the River. And that must be avoided at all costs.

Therefore it seems that one of the most important strategic moves of the near future must be to make Basra a station for fighting and bombing squadrons as well as a mere stores depot, and to keep the material for such squadrons there in addition to whatever may be needed for the supply of Baghdad and Mosul. Thus we should be ready to protect the oil-fields even when the up-River stations were fighting at full war strength.

Labour, the Navy and Singapore.

From all the foregoing it is possible to judge of the immense importance of the Singapore Base, both from the Naval and Air Force points of view. The Navy, which is primarily responsible for the Base, will naturally regard it purely from the Naval standpoint and will equip it full with docks and naval stores. So far as the Navy is concerned its only aeronautical importance will be as a supply depôt for aircraft for the Fleet Air Arm. But to the R.A.F. it should be a base for direct air operations all over the East Indies.

Aeroplanes can fly from Singapore to the Dutch aerodromes and can operate thence against Japanese sea-craft and air-craft without help from the Navy, except in the matter of the transport of stores and non-flying personnel. All the petrol and oil required can be got on the spot from the Dutch, unless the Japanese capture all the oil islands before the Air Force gets there. And if the Air Force establishes its own base on the promised aerodrome at Singapore it should be possible for it to save the chief Dutch islands even if the Navy's strength in ships should be insufficient at the outbreak of war to protect those islands.

Thus it may be seen that if the Air Ministry acts wisely and promptly it may well be the saviour of our oil supplies and so may enable us to carry on the war with success. Whereas, if Singapore be maintained simply as a Naval base it will never have enough aircraft to conduct operations apart from whatever warships may be on the Far East station at the time.

It is said that the present Labour Government does not intend to spend money on the Singapore Base, which it regards as being merely conducive to war with Japan. One hopes that this is merely a rumour and that the inside knowledge which Labour Ministers will now acquire will prove to them the vital necessity of developing Singapore to the greatest possible extent. The Labour Cabinet is composed chiefly of sound hard-headed men who are quite capable of understanding the International situation and of acting accordingly. We can at any rate afford to wait for a few months to see what their policy may be before condemning them out of pure political prejudice. And in the meantime Australia and New Zealand who appreciate the Japanese menace (and who have Labour Governments of their own) are preparing to spend more on their own defences in case our Government lets them down by neglecting Singapore.

Doing Without Oil.

One curious fact is worthy of attention in connection with the oil supply. That is that if we re-organised our methods of using coal we could be independent of our petrol supplies. During the War 1914-18 the Germans were deprived of all petrol supplies from the ordinary oil-wells. Yet they kept

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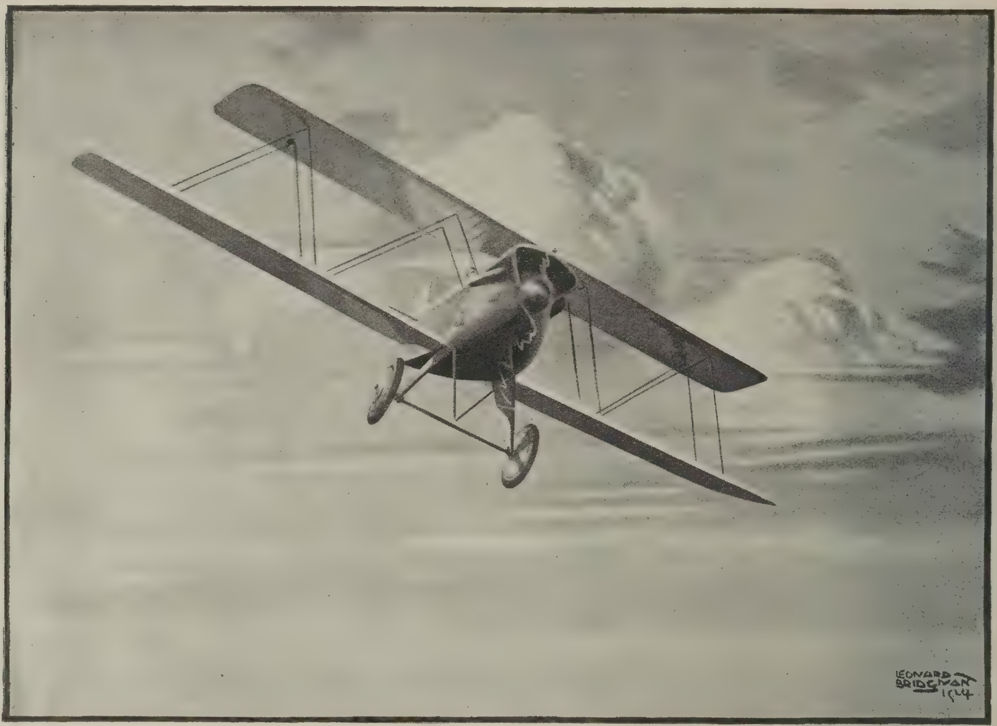

AN ITALIAN SCOUT.—A drawing by Mr. Leonard Bridgman of the new F.I.A.T. C.R. single-seater scout with a 300 h.p. Hispano Suiza engine.

their Air Force and mechanical transport going, albeit on short rations.

What they did was to develop as rapidly as possible a system of extracting from brown coal and peat a hydrocarbon spirit which was practically identical with ordinary petrol. We could produce spirit of at least as good a kind from our ordinary black coal, if we cared to put up the necessary plant. But we are not in the least likely to do so, because there are too many vested interests at stake, all the way from the house-wife who wants a coal fire in her kitchen or sitting room instead of a gas fire to the International Oil Magnate who wants his oil to take the first place in any agreement with other nations.

Therefore we shall run on oil till we run short of oil and are compelled to extract spirit and gas direct from coal at the pit's mouth, instead of burning coal and sending ninety per cent. of its potential energy up the chimney. Consequently and until then our oil supplies are quite vital to us.

THE EFFICIENCY OF AIR MAIL SERVICES.

During Mr. Baldwin's period of service as Prime Minister an Air Mails Committee was formed with the following Terms of Reference :—

> To consider the present arrangements for air mails and the possibilities for improving and extending them and the co-ordination of the work of the General Post Office and the Air Ministry in connection therewith.

The Members of the Committee were :—Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Chairman; Major-General Sir W. Sefton Brancker, K.C.B., A.F.C., Director of Civil Aviation; and Brig.-General F. H. Williamson, C.B., C.B.E., Director of Postal Services. The Secretary was Mr. L. Simon. An Interim Report of this Committee has just been presented to Parliament by command of His Majesty and is issued as a White Paper (Command 2038, price 6d.).

In order to maintain a proper degree of simplicity in its investigations the Committee divided the subject of inquiry into three sections : (1) European (cross-Channel) services; (2) Imperial services; (3) Internal services. In regard to the first of these divisions reference is made to the London-Paris, the London-Brussels-Cologne and the London-Amsterdam and Rotterdam air mail services. The Committee says :

> Despite the high standard of efficiency which has been attained, at any rate in the summer months, the amount of traffic attracted to these services has been very small. This is not due to any difficulties of an artificial kind. The special air fee in the Paris service, which was originally 2s. 6d. per oz., has been reduced to 2d. per oz.; the fee for the services to Cologne and to Holland is the same; and the fee for the German service was 3d. per oz. The Post Office has taken special steps to give the necessary publicity to the services and issues printed pamphlets giving full and exact information as to the advantages offered by the different services, time and method of posting, fees, etc. It also provides rapid transport for air mails from London to Croydon. There is no difficulty about getting an air mail letter into the post : all that the sender has to do is to affix postage stamps of the proper value, mark the letter "By air mail" (which is most simply done by the use of a printed label, supplies of which can be obtained free at Post Offices), and post it in any letter box. The reasons for the disappointingly small traffic must be sought in conditions which are inherent in the nature of the services in question, and cannot be removed by any improvement in organisation.

First among these inherent conditions is

> "The comparative shortness of the existing air routes between England and the Continent. Air transport of mails has to compete with highly developed train and steamer services and it is handicapped in the first place by the loss of time in ground conveyance at either end—since the aerodromes are much further from the central post offices in large cities than are the railway termini—and in the second place, and even more seriously, by the fact that as yet flying by night is not practicable.

It is pointed out that even with night flying the actual gain in time for letters sent by air mail over those sent by the usual methods is inconsiderable.

The Committee does not forget that

> An air mail service is not of course limited to conveying correspondence between its terminal points; and its field of greatest potential usefulness under present conditions is precisely in the conveyance of correspondence between places further apart than those points. In other words, the proper function of an air service such as those now under consideration is to be a link in a chain of communication of which the train or the steamer also makes a part. In a combination of this kind the maximum advantage will be gained on a route made up of a whole day's flight both preceded and followed by a whole night's rail or sea transit.

The Committee says that the International Conference held

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at the Hague in the beginning of November brought about an important development in the direction outlined above by its approval of a scheme for the establishment of an air service between Rotterdam and Malmö, a scheme under which a period of 24 hours is gained over the ordinary route.

In regard to European services the Committee comes to the following conclusions :—

> (A) The existing air mail services between England and the Continent are, so far as letter mails are concerned, in the nature of express services, and cannot expect to obtain more than a small fraction of the traffic. For parcel mails they offer wider, though still limited, possibilities.
>
> (B) The right line of development for letter air mail services to and from the Continent is to be found in combination with train and steamer services working by night.
>
> (C) For letters posted in or addressed to London, the most useful services will be those which start from and end at air termini on the Continent at the distance of a night's train and steamer journey from London. Services starting from and ending at Croydon will be of use primarily for provincial correspondence (which is more than half of the total Continental correspondence of the country).
>
> (D) The only practical policy for the Post Office, at any rate in the absence of night flying and of complete reliability of air services at all times of the year, is to maintain the present system, under which no letter is sent by air unless it is marked by the sender for air transmission and prepaid with a special fee. The development of aviation should, however, be closely watched, and every opportunity should be taken to improve the Air Mail Service.

In regard to Imperial Services the Committee says that "the smallness of the mails coupled with the relatively high cost of transport makes it impracticable in present conditions to regard the carriage of mails as anything more than a subsidiary function of a commercial air route no matter how much acceleration it might offer."

It refers to the success of the French aeroplane service operating between Toulouse and Casablanca (about a thousand miles apart) which now after some years' experience is carrying letters at the rate of about three million a year. A reference is then made to the Cairo-Baghdad air service and it is stated that about 30 per cent. of the first class mail to Iraq has been attracted to the air service and that the revenue from air fees has amounted to as much as £9,000 a year, but it is not a commercial service. It is strategic in its origin and its revenue bears no relation whatever to its cost. Further, the Haifa-Baghdad weekly motor service offers practically the same acceleration for Iraq mails as the fortnightly air service. In consequence the air route has already lost a great deal of traffic. The Committee considers it probable that if the route were taken over by a commercial company the volume of mail would be increased and the service to the Empire would become infinitely greater.

The Burney scheme is discussed and in consequence of the official acceptance of the scheme the Committee has found it necessary to write the following :

> During the course of our inquiry we had put before us by Brig.-General Spears, M.P., and Commandant Faure a scheme for a combined Anglo-French aeroplane mail service to India. The idea is that a French service should cover the distance from Marseilles to Alexandretta in 30 hours flying both day and night and that a British service should continue from Alexandretta to Bombay. It is claimed that by such a service, starting from Marseilles immediately after the arrival of the Indian Mail from Great Britain, Bombay could be reached on the fourth day after departure from London. In view of the acceptance of the Burney scheme, we have not thought it necessary to give detailed consideration to the proposal for an aeroplane service.

The conclusions on the Imperial Services section of the Report are as follows :—

> (A) At the present stage of development the most hopeful field for Imperial air mail services on a commercial basis is to be found along the main lines of Imperial communication, not on bye-routes to outlying and commercially unimportant territories.
>
> (B) The adoption of the Burney airship scheme reduces the importance of urgent consideration at the present time of an aeroplane service on the route between Great Britain and India.
>
> (C) The value of the Burney service for mails will be tested by its use for specially prepaid correspondence, and the question of transferring mails in bulk from the sea to the air route is one for later consideration.

In the Internal Services section there is full consideration of the question of an air mail service between Great Britain and Ireland. As no such service is at present in existence it is unnecessary to give any detail in this matter. The conclusions on Internal Services are :

> (A) There is very little scope for internal air-mail services in present conditions, and the introduction of night flying would not increase it to any material extent.
>
> (B) An internal air-mail service designed to accelerate the onward transmission of mails from abroad after landing at a British port requires conditions which are not fulfilled in the case of American mails landed at Plymouth. These conditions are :—
>
> (1) The speediest possible transmission by sea, and
>
> (2) A more or less regular arrival, preferably in the early hours of the morning.

In regard to the future of the Committee the final paragraphs of the Report are of interest.

> We present this as an Interim Report, because we regard it as possible that our Committee may be expected to continue in being and to present further reports from time to time, whether on the general principles which should govern air mail policy, or on particular proposals. Much, however, seems to depend on the future of the Civil Aviation Advisory Board. If that Board is to be revived, whether in its original form or in another, its field will presumably include any question which could usefully be referred to ourselves.
>
> In this connection we would refer particularly to the concluding words of our terms of reference, which speak of "co-ordination of the work of the General Post Office and the Air Ministry in connection" with air mails. We have not found lack of co-ordination between the work of these two Departments; but a small Committee such as this, including one representative of each Department with a Chairman who is outside both, seems to us to afford a convenient opportunity for the exchange of views which are necessarily formed to some extent from different angles.

The appendices are excellent and give statistics as to the efficiency of various air routes. Appendix II deals with the Plymouth-Belfast experimental air service in some detail and gives an interesting table of "the effect on articles of a fragile and semi-fragile nature dropped by parachute."

The Secretary of State for Air and his Intentions.

On Thursday, Feb. 7, the Secretary of State for Air of the newly formed Government gave an interview to a number of representatives of the general and the Technical Press at the Air Ministry.

Brig.-Gen. Thomson (as one must call him pending the announcement of his new title) in opening the interview, pointed out that it was obviously impossible for him at that moment to make any very definite statements as to the probable future policy of the Government in regard to the Air Ministry. He was afraid that he had already been somewhat of a nuisance to his colleagues of the Cabinet, and he foresaw the possibility that he might in the future be a perfect pest to them, but up to the present he had not even had the time to make himself properly acquainted with the present state of affairs in connection with military and civil aviation, and the Cabinet obviously could not have given any detailed consideration to the details of their Air Policy. Under the circumstances it would probably be necessary to refuse to answer many questions which it would be desired to put to him, and in such cases as he was able to answer at all, it must be understood that he was rather expressing the present trend of his own opinions than forecasting what would be his activities in the future.

The actual proceedings took the form of questions put by the Press representatives in turn and of answers by the Secretary of State. The various answers relating to the same or cognate subjects have here been sorted out to give to this account a continuity necessarily lacking in a verbatim report of the proceedings. It will therefore be understood that what follows is rather an impression of the whole attitude taken by the Air Minister than a record of proceedings.

The question as to whether the present separate Air Force was to continue or was to give place to Naval and Military Air Services had not come before the Cabinet and was not likely to. Personally, he did not favour splitting the Air Force. Neither had the question as to whether the programme of the late Government for the expansion of the Air Force should be continued. Obviously a Labour Government which desired to institute a large programme of Social Reform would welcome any possible saving on Military Services which did not impair the National Safety. He recognised that for this country Aerial Defence was the most vital of all defences.

The agreement with the Imperial Air Transport Company was an accomplished fact, and so far as his knowledge went there was no foundation for the rumour of any hitch in the consequent proceedings. He could make no pronouncement as to the future of the Burney scheme for Imperial Airship Services. That scheme would require the passing of a Bill through Parliament and therefore nothing would be done in the matter without due warning. Undoubtedly the provision of rapid Imperial communications would be of extreme value and would be duly encouraged.

He had the desire to develop the airship to the greatest possible extent. It was necessary to give every possible encouragement to air travel and it seemed to him that the airship was likely to be extremely useful in the popularisation of Air travel.

It was his wish that the Air Ministry should foster and

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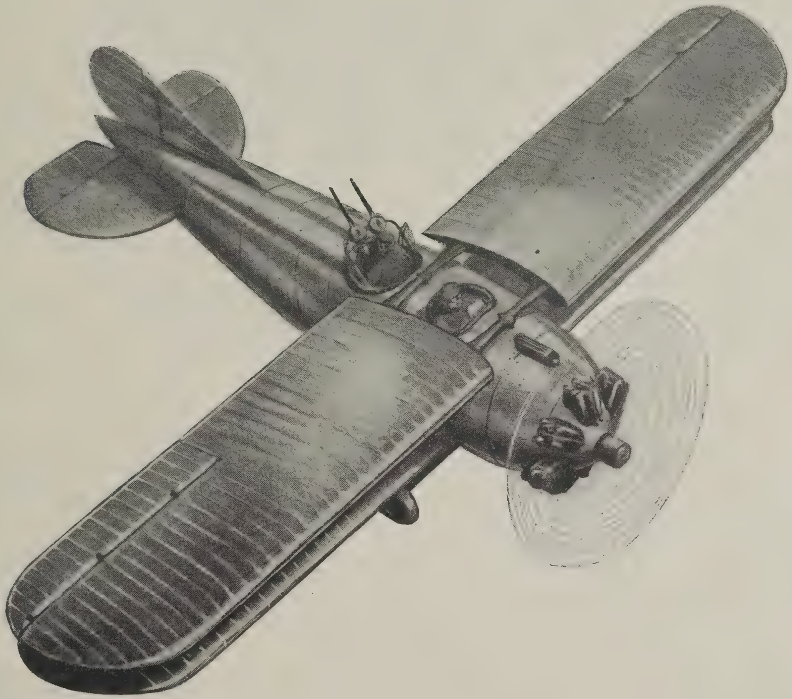

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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encourage every form of enterprise and experiment in connection with aviation, and he should make it his endeavour to encourage research, both by official and by independent bodies to the utmost extent.

He was firmly convinced that the future of Great Britain was in the air and he was determined to encourage enterprise in the development of Aviation wherever it was to be found.

The French Light Aeroplane Circuit.

The Under-Secretary of State for French Aeronautics has decided that all aircraft competing in the Tour de France des Avionettes will receive from the Service de la Navigation Aérienne a special passport. The conditions under which the usual regulations will be modified will be issued in booklet form, copies of which can be obtained from the Secretariat de l'Association Française Aérienne, 40, Quai des Célestins, Paris. ive.

Constantinople-Angora Service.

Experiments are being made with a view to establishing an air service between Constantinople and Angora, a distance of 230 miles. Trial flights are being carried out, using Junkers monoplanes. The journey is expected to occupy three hours and it is hoped to establish a regular service running three times a week.

Stolen French Aero Engine Designs.

It is reported that an engineer, Antoine Thivat, employed in the drawing office of the Breguêt Aircraft Works at Velizy has been arrested and charged with stealing various designs. Two Russians, one of whom was a typist and the other a foreman at the Nieuport Works, have also been arrested. It was at first thought that the disappearance of designs and other documents at the Breguêt Works, which has been noticed for some time, was due to political espionage, and, as might have been expected, the Germans were at once blamed.

The fact that the Ministry of War has not yet taken much interest in the case is noteworthy and it is considered probable that rather than being an international affair the theft was carried out for the benefit of a rival firm.

The charges against Thivat related to a new engine on which the Breguêt firm have been working on for the last two years. Presumably this is the Breguêt Bugatti engine. Plans have been found on Thivat's person and a number of other documents have been found at his rooms.

THE ROYAL AIR FORCE.

London Gazette.

Feb. 5.

General Duties Branch—M. J. DuCray is granted a S.S. commn. as a Flg. Off. on probation with effect from, and with seny. of, Jan. 23.

Stores Branch.—Fyg. Off. J. L. Armstrong is granted a perm. commn. in the rank stated for accountant duties (Feb. 6).

Medical Branch.—The follg. are granted S.S. commns as Flg Offs, with effect from, and with seny. of, Jan. 23:—S. G. Gilmore, T. Glynn, M.B.; Flg. Off. T. A. G. Hudson is promoted to the rank of Flt. Lt. (Jan. 27).

Reserve of Air Force Officers.—The follg. offs. are confirmed in rank, with effect from the dates indicated:—Flg. Offs.: S. H Gaskell (Oct. 20, 1923); C O. Meeke (Dec. 19, 1923); C. E. Young (Jan. 20); H. E. R. Nelson (Jan. 24); E. A. Clear, M.C., P. B. Clews, F E. Hills, A. J. P. Hytch (Jan. 31). Plt. Offs.: D. C. Bain (Jan 20); R R. Rich (Jan. 31)

Memoranda.—The follg. relinquish their temp. commns. on ceasing to be empld.:—Sq. Ldr. A. W. Northover, M.C. (Oct. 10, 1913); Flg. Off. L H Morgan-Browne (Nov. 21, 1923).

Appointments.

Week ending, Feb. 11.

General Duties Branch.—Squadron Leader W. H L. O'Neill, M.C., to H.Q., Coastal Area, 18/2.

Flight Lieutenants F. R. Alford, M.C., to No. 100 Sqdn., Spittlegate, 18/2; R. W. Chappel, M.C., to I.A.A.D., Henlow, 11/2; F. J. Vincent, to No. 32 Sqdn., Kenley, 14/2; W. H. Park, M.C., D.F.C., to Aeroplane Exper. Estab., Martlesham Heath, 12/2; J. A. W. Binnie, to No. 24 Sqdn., Kenley, 12/2; H. S. P. Walmsley, M.C., D.F.C., to Boys' Wing, Cranwell, 14/2; A. E. Dark, to Armament and Gunnery School Eastchurch, 14/2; F. J. Fogarty, to No. 2 F.T.S., Duxford, 14/2; E. G. Hilton, A.F.C., to No. 7 Sqdn., Bircham Newton, 14/2; G. Martyn and W. H. Markham, to No. 7 Sqdn., Bircham Newton, 12/2; K. A. Lister-Kaye, to No. 11 Sqdn., Bircham Newton, 17/2.

Flying Officers J. C. Barraclough, to Aircraft Depot, Egypt, 26/1; C Bousfield, to No. 14 Sqdn., Palestine, 26/1; H. A Castaldini, to Marine and Armament Exper. Estab., Isle of Grain, 1/2; J. H. Gray, to No. 5 F.T.S., Shotwick, on transfer to Home Estab., 31/1; A. S. Godley, to No. 24 Sqdn., Kenley, 11/1; L. W. Mercer, to R.A.F. Trans-Jordania H.Q., Palestine, 1/2; E. V. H. Hudson, to No. 14 Sqdn., Palestine, 1/2; D. S. Buchanan, to No. 7 Sqdn., Bircham Newton, 1/2; J S. Harrison, to R.A.F. Base, Gosport, on transfer to Home Estab., 14/2; P. J. Chambers, to No. 2 Sqdn., Andover, on transfer to Home Estab, 29/1; T. S. Horry, D.F.C., to Night Flying Flight, Biggin Hill, 12/2; G. C. Bladon and A. E. Beilby, to R.A.F. Base, Gosport, 12/2; O. D. Freeman, to School of Photography, S. Farnborough, 11/2; J. G. Peck and D. C. France, to No, 2 F.T.S., Duxford, 13/2; C. W. McK. Thompson, to No. 24 Sdn., Kenley, 7/2; R. F Browne, D.F.C. to No. 5 Armd. Car Coy. Iraq, 22/1; J. A. Hollis, H. A. Boniface, E. Cuthbert, and E P. Colam, to Aircraft Depot, India, 5/12; E. N. D. Worsley, to No. 4 F.T.S., Egypt, for course of instruction, 19/12; H J. T. Russell, to No. 70 Sqdn., Iraq, 8/1.

Pilot Officers B. D. J. Broadway to No. 32 Sqdn., Kenley, 7/2; R. Scott-Taylor, to No. 25 Sqdn., Hawkinge, 7//2; E. Reid, to R.A.F. Base, Leuchars, instead of to 111 Sqdn., as previously notified, 8/2; J. W. New, to No. 7 Sqdn., Bircham Newton, 11/2; L. V. H. G. Clark, to No. 4 F.T.S., Egypt, for course of instruction, 1/2; G. R. A. Pallin, to No. 4 F.T S., Egypt, for course of instruction on appointment to a S.S commn., 31/1.

Medical Branch.—Squadron Leader (Medical) D'A. Power, M.C., to R.A.F. Depot, on transfer to Home Estab., 23/12. Flight Lieutenants (Medical) D Le Bas, to R.A.F. Depot, on transfer to Home Estab., 10/1; J. C. T. Fiddes, M.B., and W. D. Miller, M.B., to R.A.F. Depot on transfer to Home Estab., 23/12; (Hon. Sq. Ldr.) H. B. B. Greene, to R.A.F. Depot, 12/2; F. T. Allen, to Aeroplane Exper. Estab., Martlesham Heath, 7/2. Flight Lieutenant (Q.M., Medical) J. M. Maxwell, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab., 23/12; Flying Officers (Medical) S. G. Gilmore, to No. 1 School of T.T. (Boys), Halton, 13/2; T. Glynn, M.B., to R.A.F Base Gosport, 13/2; T A. G. Hudson, B.A., to R.A.F. Depot, on transfer to Home Estab., 23/12. Flying Officer (Q.M., Medical) F. W. Goodread, to R.A.F. Depot, on transfer to Home Estab., 23/12.

Store and Accountant Branch.—Squadron Leader (Stores) J. C. E. Gillham, to H.Q., Iraq, 1/1; Flight Lieutenants (Stores) N. R. Fuller, to No. 10 Group H.Q., Lee-on-Solent, 22/2; W. C. Green, M.C., to 22/2, Cranwell, 15/2; F. Whilton, D.C.M., to Marine and Arm. Exper. Estab., Isle of Grain, 1/2. Flight Lieutenant (Accountant) C. C. J. Croydon, to No. 1 School of T.T. (Boys), Halton, 12/2. Flying Officers (Stores) A. T. Shaw, to R.A.F. Depot, 11/2; R. Blackith, to No. 56 Sqdn., Biggin Hill, 11/2

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Rugby Football.

R.A.F. v. Blackheath:—Played at Blackheath on Feb. 9 this match resulted in a win for the R.A.F. by one placed goal, one dropped goal and one try (12 points) to one penalty goal (3 points). The rain during the few days previous to the match made the ground very slippery and the ball difficult to handle with the result that the passing on both sides was well below the usual form. Blackheath were handicapped by injuries playing only 14 men during the greater part of the game. The R.A.F. having the heavier pack controlled the scrummages, Sq. Ldr. Russell working them well and generally playing a brilliant game.

Flt. Lt. Lowe opened the scoring for the R.A.F. by dropping a goal with his left foot while hemmed in by Blackheath backs. The two tries which followed this were both scored by Flt. Lt. Chick who was well supported by a fast and clever pack whose footwork was particularly good.

The R.A.F. team were:—

Cpl. A. Wale, back; Flt. Lt. C. N. Lowe, Sjt. Snaith, Flt. Lt. O. C. Bryson, and Flg. Off. A. E. Forrest, three-quarter backs; Sq. Ldr. J. C. Russell and Plt. Off. J. W. Colquhoun, half-backs; Flt. Lt. R. H. Usher, Flt. Lt. J. Chick, Flg. Off. F. Isaacs, Flg. Off. C. Adams, Flg. Off. T. Rose, Flg. Off. E. Wackett, Cpl. Johnson, and Ldg. AC. Collins, forwards.

The Navy League.

In a statement circulated by the Navy League to all its branches as embodying the League's considered opinion on the existing naval situation, the following paragraph concerns the aerial arm of the Fleet:—

> Whatever modifications in the means of warfare on communications the development of air power may eventually lead to, at present, and as far as the human mind can project itself, the bulk of British commerce will be water-borne. It is freely admitted that naval power will, in future, be incomplete and insufficient without an air arm for reconnaissance and for offensive and defensive action.

Air Route Survey in India.

The Times own correspondent, writing from Delhi on Feb. 5, states:—

> Two R.A.F. officers have been lent to the civil authorities in order to make a survey or a re-survey of the following air routes:—Karachi-Delhi, Calcutta-Bombay, Delhi-Bombay, Allahabad-Calcutta, and Calcutta-Akyab-Rangoon.
>
> Until night-flying becomes practicable it is unlikely that any but the last route will be commercially possible for mail carrying The advantages of an air route from Calcutta to Burma, on which only daylight flights would be necessary, are so great that when the financial position has improved its organisation will obviously have the first call on the attention of the authorities.

An Indian Command Dinner.

A Re-union Dinner for serving officers of the R.A.F. who have served in the (R.A.F.) India Command will be held at the Savoy Hotel on Saturday, March 8, at 8 p.m.

Air Vice-Marshal P. W. Game, C.B., D.S.O., will take the chair. Tickets, 15s. 6d. each, exclusive of wines, may be obtained from Flt. Lt. C. J. S. Dearlove, R.A.F. Depot, Uxbridge. Application for tickets should be made before Mar. 4.

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THE FLYING BOAT AND AIR OPERATIONS AT SEA.

Although the Air Ministry during the past few years has devoted a very considerable amount of money and effort to the development of aircraft intended for naval purposes of one kind and another, it is noticeable that practically all the new types so evolved have been relatively small machines of a type suitable for use from an aircraft-carrier ship. Undoubtedly this development of the ship-carried type of naval aeroplane has had the support of the British Navy, which not unnaturally looks with less distrust upon a machine which forms part of a ship's equipment than upon any type of aircraft capable of independent overseas operation.

Ship-carried v. Sea-going Craft.

No doubt the development of the ship-carried aeroplane has been fully justified. Even if it were to be shown in the near future that the ship-carried aeroplane was a valueless weapon the inherent difficulty of producing machines with the required characteristics has led to a very considerable technical development of a nature calculated to be of considerable value for quite other types of machine.

This concentration on the ship-carried type has unfortunately been accompanied by a very considerable neglect of the larger type of sea-going aircraft. The Air Ministry itself has carried on a good deal of experiment with existing types of large flying boats, apparently in the sound belief that this type of aircraft would eventually be found to be of considerable importance, but apparently it has not possessed enough money to build new flying boats in addition to meeting the naval demand for new ship-aeroplanes. There are fortunately signs that this state of affairs has altered slightly for the better and there is a likelihood that new large flying boats will be produced in this country in the near future.

Practically all the large flying boats in existence at the present time are of war-time design. Not only are they out-of-date structurally and aerodynamically, but they are limited in their all-round utility by having been designed for the conditions of a particular campaign. In addition their use during the war from shore bases for operation over relatively narrow waters has created an impression that they are only suitable for use in similar circumstances. The very great labour involved in getting big boats in and out of their sheds, the serious risk of damage to machines in this process, the extremely high cost of the shed accommodation and so forth needed at the war-time type of flying boat station have all contributed to a false idea of the clumsiness and limited value of this type of aircraft.

It has always been an article of faith on the part of those who have championed the large flying boat that such a craft should be regarded at least eventually as permanently water-borne craft, and that sheds, slipways and handling parties should only be required at repair bases and not for normal operation.

It was long ago shown that a reasonably designed and built flying boat of fair size could ride at moorings in moderately sheltered waters during winds of surprising force. In some cases the wind has reached sufficient violence to lift boats and moorings into the air and fly them ashore before the boats have failed under water loads. Generally speaking flying boats until quite recently have never been given the chance of proving their water-keeping qualities, but have been hauled out of the water on every possible occasion, with the result that they have often suffered structural damage to the hulls, and have generally deteriorated as a result of alternate wetting and drying of the hull structure. Thus the flying boat has earned a worse character than it deserved largely as a result of having been too often removed from the water.

Experience in the Pacific.

During the past two years or so the Chilian Naval Air Service under the direction of Lt.-Col. J. L. Travers have had in use on the Pacific coast a number of British "F" boats with three-ply covered hulls. According to the general opinion in this matter three-ply is a very unsatisfactory material for boat hulls—yet these boats have been regularly moored out in the sea for 9 months at a time—without developing any sign of leaking or deterioration. A hull continuously moored out in this way is subject to much more uniform conditions of humidity and temperature than one which is brought ashore after every flight, and this fact undoubtedly accounts for the satisfactory results obtained with three-ply in this case. This particular case is the more noteworthy as it is understood that three-ply on land machines in Chile is a source of endless trouble.

The most frequent source of trouble with flying boats at moorings is failure of wing-tip floats. As this is quite likely to result in the complete loss of the craft the wing-tip float represents a serious problem, which is most satisfactorily to be solved by the suppression of this adjunct. The wing-tip float may be avoided by the use of wing-roots growing out of the hull as in certain Dornier designs, or by the use of a stoutly built waterproof lower wing with a considerable dihedral normally in contact with the water as in a recent design due to the English Electric Co. Up to the present this alternative to the wing-tip float system has not been subject to any extensive tests at sea, but it promises relief from some of the wing-tip float trouble. Should it fail in practice it seems probable that large flying boats will have to be of the double-hull type.

This particular question of detail does not seriously affect the main issue—which is that large flying boats are not necessarily confined to operation from an expensively equipped base, but may be kept afloat for long periods. Practically this means that a squadron of such boats, plus a mother-ship, which would serve as a fuel depôt and a running repair workshop, can be used as a mobile unit which can operate from any harbour which will serve as a shelter for the mother-ship in bad weather and on the high seas under reasonably favourable conditions. It is probably safe to prophesy that it will be found possible for a flying boat to be taken in tow and refuelled through a pipe line in any wind and water conditions in which there is any chance of effecting a landing on a ship's deck, and that the combination of mother-ship and flying boats will form a much more effective sea-going force than the aeroplane carrier and ship aeroplane at present so highly esteemed.

Moreover the large flying boat is pretty certainly capable of development into a much more potent offensive and defensive craft than the relatively small deck-landing aeroplane. It will possess a much larger radius of action, will be capable of carrying a much heavier armament, and in many cases will be capable of really long distance raids or reconnaissances as an independent unit. The deck-landing aeroplane relies entirely on the presence within a hundred miles or so of its parent ship. The large flying boat, given an occasional fuel depôt along its course could make journeys of thousands of miles without escort.

The Weakness of the Carrier Ship.

The present type of aeroplane carrier ship is an extremely expensive and distinctly vulnerable affair. The small radius of action of its aeroplanes makes it necessary for the ship itself to remain in close attendance on the fleet with which it is to operate. In order to cover the inevitable delay incurred whenever aeroplanes are leaving it, or attempting to alight on it, it must be appreciably faster than the fleet itself. As aeroplanes are fairly bulky articles it has to be a large ship if it is to carry any appreciable aerial force.

The big-boat mother-ship need not accompany the fleet at close quarters, and compared to the aerial force to which it is attached can be of relatively small size for it will at most only be expected to house one or two boats at a time and then only for emergency repair work.

The present type of aircraft carrier may cost up to £6,000,000 for the ship alone and such a ship will carry twenty to thirty small aircraft of a total cost of £120,000 to £150,000. That is, the ship costs forty times as much as the aircraft that are served by it. In the case of the big boat and mother-ship combination a good deal less money spent on ships would provide mobile bases for a much larger and in many respects a more effective sea-going air force.

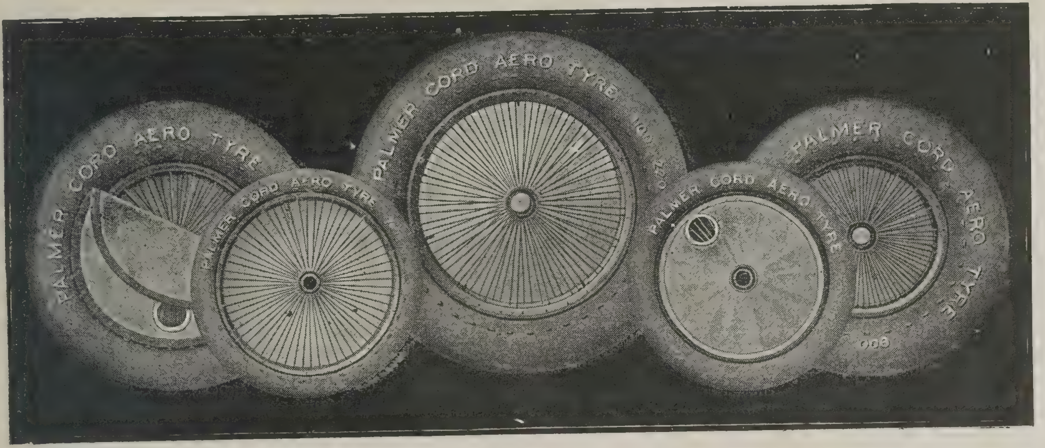
The Flying Boat and Mother Ship Unit.

The combination of the big long-range flying boat with a mother-ship would render possible the aerial patrol and surveillance of wide stretches of ocean which cannot be attained by any other means except at a colossal and unbearable cost. Considering how dependent the British Empire is on ocean communications, it is obvious that the sea-going flying boat deserves a good deal more development and attention than it has received in the past few years. Fortunately the big boat has not received much more attention in other countries than it has in Britain, and so far as the practical design of sea-going aircraft is concerned this country has nothing to learn from its rivals. But the type has a much greater value to the British military services than it has to that of any other nation, and therefore we should not be content to wait upon the rest of the world, but should actively set about replacing our now departed naval supremacy by an equally decisive supremacy in aerial control of the ocean highways.

In a paper before the Royal Aeronautical Society on Feb. 7 Squadron Leader Maycock discussed at some length the problems of handling flying boats on the water. This paper may produce an impression that these difficulties are so serious at present that the flying boat can as yet serve no great useful purpose. It should however be recollected that the work to which the paper refers has been carried out largely with very ancient craft, used almost entirely in British waters. There is good reason to hold that the climatic conditions and the congested nature of the harbours in this country exaggerate the troubles encountered and that in many parts of the world the seaplane can be used with successful results even now.—W. H. S.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132 46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	36*	185.	55.	135/50
,,	40*	185.	60.32	135/50
,,	152	185.	66.67	135/50
,,	163*	185.	66.67	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60
,,	141	250.	80.	Central
,,	201	185.	60.32	125/60
1000×150	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
900×220	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

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U/N/NN.

THE WORK OF SEAPLANE PILOTS.

At a meeting of the Royal Aeronautical Society on Thursday, Feb. 7, Squadron Leader R. B. Maycock, O.B.E., R.A.F., who until recently commanded the Royal Air Force Seaplane Development Flight, read a paper entitled "Airmanship at Sea" dealing with the handling of seaplanes, especially flying boats, on the water.

One of the factors which had hampered development he said was that the seaplane had developed from the aeroplane by the addition of "sea boots." Most types of seaplanes are easy to fly once they are in the air but caused considerable difficulties in handling on the water, and therefore combined knowledge of flying and seamanship is essential for the seaplane pilot. Unlike the aeroplane, the seaplane's trials and tribulations do not end with the safe alighting after a flight, but continue while "taxying" to moorings or to the slipway.

It has been said that mooring a seaplane is analagous to mooring a fully-rigged ship with the sails set but the lecturer preferred to liken it to a motor auxiliary vessel with the sails set, the yards rigidly braced for a wind astern, and the spanker rigged to replace the water rudder—without the possibility of reversing the engines. Nevertheless the lecturer had seen small and difficult harbours—such as Penzance, Newhaven and Torquay—successfully navigated by large flying boats threading their way between large and small craft, frequently lifting a wing to clear a dinghy or buoy, the width between the piers at the harbour entrance being just sufficient to allow the span of the wings a few feet clearance.

Wind has infinitely more effect on seaplanes than tide owing to the large wing-structure swinging like a weathercock to the breeze. The use of a water-rudder has been abandoned, but the ailerons are of great assistance in manœuvring on the water. The remaining aid to steering is the "drogue" or sea-anchor, which on being dropped into the water acts as a fulcrum about which the craft can be more easily turned.

If a seaplane is held against the wind either by an anchor or by using the engines it will keep perfectly dry, as has been proved in practice in St. Mary's Roads at the Scilly Isles during an experimental cruise in 1922.

The practice of mooring out seaplanes instead of confining them to places where a special slipway and sheds are provided is becoming more and more common and has great advantages. For major overhauls and repairs they still have to be got on shore but for running repairs a floating dock could be used. Permanent moorings for flying boats should weigh not less than a ton. The buoy chosen is usually small and it is the practice to make fast direct on to the mooring wire beneath the buoy to obviate the danger arising from possible weakness in the buoy's fittings.

In conclusion the lecturer mentioned that flying boats have flown from Malta to Constantinople, Gibraltar and Alexandria involving flights of 1,500—2,000 miles. Tests have been carried out in home waters of flying boats proceeding on endurance trips away from their base up to six weeks with satisfactory results.

THE DISCUSSION

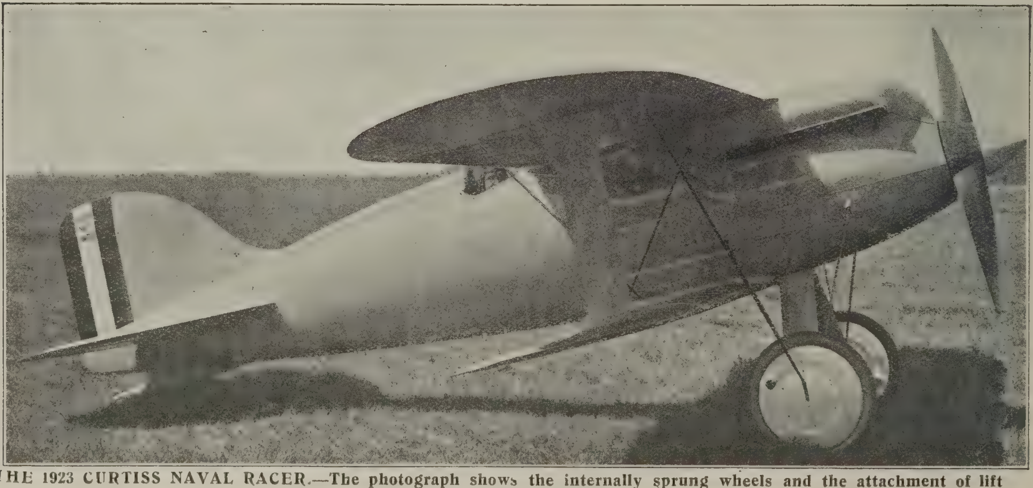
Col. Ogilvie (Chairman) opening the discussion said seaplanes presented their difficulties but they had the advantage that they could be built of large size. He thought it was impossible as yet to decide what was the right line to take in seaplane design.

Commander Towers, U.S.N., referring to his experiences on N.C.3 during the Atlantic flight said that the comfort and dryness of a flying boat at sea was a matter of the relative size of sea and boat. In the N.C.3 he came down onto the water to get a wireless bearing when visibility was so bad that it was not until they were on the water that they realised it was too rough for them to get off again. While they were on the water the wind rose to 70 m.p.h. and the sea with it. Their most uncomfortable time was during the building up of the sea; when it got to a really big swell they just rode up and down. The seagull which the lecturer had taken as an example of how to keep dry at sea did not do well in ripply water but was all right in waves. If the sea had not got up after their landing on N.C.3 they would never have survived. A really big sea could be ridden comfortably—it was an angry chop which broke over the machine that was fatal.

Wing Commander T. R. Cave-Brown-Cave said the seaplane had suffered from an underestimate of the difficulties involved in its operation, and the assumption that it was just an aeroplane for any pilot. The lecturer had pointed out the importance of the element of seamanship, but it should be said that quite a different type of seamanship to that involved in the handling of normal floating craft was involved. He thought it might even be a drawback to a seaplane pilot to possess a previous knowledge of seamanship for he might be perturbed and confused by the utterly changed conditions. The difficulties of seaplane work could be solved by energy expended on work such as that carried on by the lecturer. He agreed with the lecturer that 45 per cent. of accidents to seaplanes was due to lack of knowledge of the handling of machines, but he thought it was kinder to call it lack of experience. The trouble was that few pilots had any chance of acquiring the necessary experience.

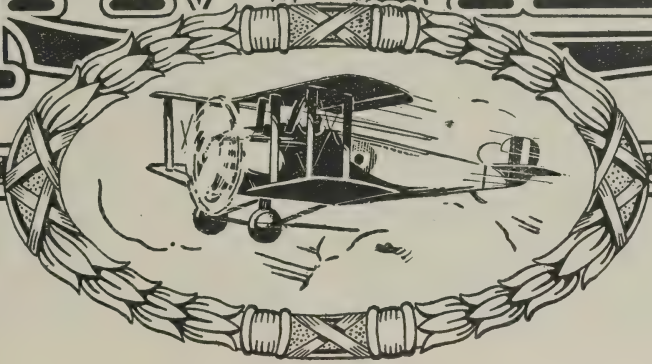
Major Brackley said that in training the personnel of the Japanese Navy the difficulty of giving the necessary experience in the handling of seaplanes had been acutely felt. It had been impossible to convince the Higher command that the few months' training needed to teach the elements of flying and handling a seaplane were not all that was necessary to the production of seaplane crews, and they found their pupils were removed to other duties as soon as they were just beginning to become useful. Personally he thought many of the troubles of the seaplane would be overcome by satisfactory amphibian gear, but present types left much to be desired.

Flight Lieut. B. C. H. Cross said that seaplane flying was not an art that could be taught by books. Experience alone—the making of mistakes and learning therefrom—would make the complete seaplane pilot. He would like to have the lecturer's opinion as to the ultimate aim of seaplane development. He thought himself that the ideal to aim at was the ability to get as far away as possible from aerodromes, sheds, slipways and motor boats. He hoped it



THE 1923 CURTISS NAVAL RACER.—The photograph shows the internally sprung wheels and the attachment of lift wires to the fixed axle.

HAWKER



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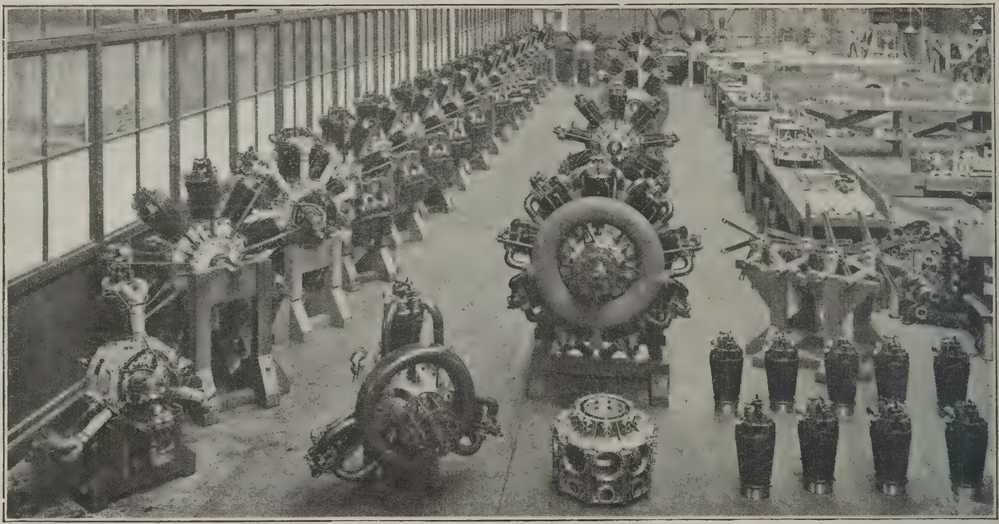


BRISTOL AIR-COOLED ENGINES.—A view in the engine shops of the Bristol Co. showing a batch of Jupiter and Lucifer engines ready for delivery.

would soon be possible for the flying boat to require no more than a reasonable anchorage and one trawler with fuel and oil as a base equipment.

Squadron Leader Maycock in reply agreed with the majority of the speakers. He did not think he could lay down an ultimate aim for the development of flying boats—they had to explore and exhibit their capabilities. He agreed as to the desirability of getting away from sheds, slipways, and particularly from motor boats which were the seaplane's worst enemy. But he was quite certain that the big flying boat had an immense future both for civil and for military purposes.

A Remedy for Rust.

Rust is one of those things which should be prevented rather than cured. Unfortunately it is rarely prevented and any satisfactory method of removing rust and its effects must have a very wide field of use.

G. D. Peters and Co., Ltd., of Caxton House, London, S.W.1, have just put upon the market a preparation known as Graphol which certainly has valuable properties. Graphol consists of very finely divided graphite in suspension in a very thin and somewhat volatile liquid. It is claimed that the fluid—which is non-corrosive—attacks and to some extent dissolves rust, penetrates through the rust film carrying the graphite with it and depositing a thin film thereof on the metal surface.

A sample tin of Graphol has just been tested on the writer's car. Certain bolts and nuts on wings and chassis which had hitherto defied all efforts either to tighten or to remove were unscrewed quite easily after a dose of Graphol had been applied. Sparking plugs which have always refused to unscrew without unscrewing the valve caps became perfectly docile after a similar treatment.

The springs which were distinctly rusty have become far too lively for comfort after having Graphol squirted on to their sides, and quite a number of badly rusted places have acquired a smooth black surface after Graphol had been left on them for a few minutes and the rust had been rubbed off with a rag.

There does not seem to be any room for doubt that Graphol will penetrate into the most unlikely places and that it does carry graphite with it. It thus serves to lubricate places otherwise entirely inaccessible to normal types of lubricant, and it certainly loosens rust even in the threads of nuts and bolts, in such a manner that bolts and nuts which otherwise have to be cut off can be unscrewed by normal methods.

New Technical Literature.

Aeronautical Research Committee, R. & M. No. 880 Flight Tests with the R.A.E. Electrical Indicator. By the Staff of the R.A.E. Price 1s 3d. net.

R. & M. No. 881. The efficiency of a Tandem System of Airscrews. By H. Glauert. Price 3d. net.

Ergibnisse der Versuchanstalt zu Göttingen. Edited by Dipl. Eng. Dr. L. Prandtl (2 vols). Published by Verlag R. Oldenbourg; München and Berlin. Price, Vol. 1, 7 gold marks; Vol. 2, 6 gold marks. (Note: The first volume is a new edition with unimportant alterations of the volume published in 1921, now out of print. The second volume consists of entirely new matter.)

National Advisory Committee for Aeronautics (U.S.A.). Administrative Report for 1923. Government Printing Office, Washington, D.C., U.S.A. Price 10 cents net. (A summary of the work carried out under the auspices of the Committee, together with an index to the technical publications issued during 1923.)

Air Ministry Notice to Ground Engineers.

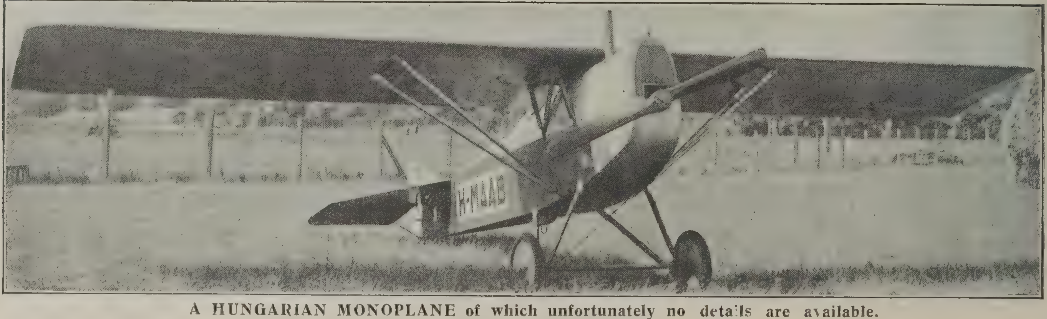
No. 3, 1924.—PERIODICAL INTERNAL INSPECTION OF FABRIC-COVERED COMPONENTS.

It is hereby notified:—

1. Attention is directed to the necessity for a periodical inspection of the internal details of fabric-covered components, particularly in the case of components incorporating spars of laminated construction.

2. The inspection of aircraft by representatives of the Secretary of State for the purpose of renewal of the Certificate of Airworthiness, which normally takes place at yearly intervals, will accordingly in future include inspection of the internal details of fabric-covered components, and the certificate will not be renewed without such internal inspection. Under existing methods of construction of such components, this will necessarily involve the opening up of the fabric to a considerable extent and in some cases the complete stripping of the component may be required.

Air Ministry, Feb. 1, 1924



A HUNGARIAN MONOPLANE of which unfortunately no details are available.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 13; Tuesday, 13; Wednesday, 12; Thursday, 12; Friday, 11; Saturday, 8; Sunday, 0.

LONDON—PARIS—ZURICH :
Handley Page Transport, Ltd., machines 11, passengers 37, freight 8.496 lbs.

LONDON—OSTEND—COLOGNE :
Instone Air Line, Ltd., machines 19, passengers 24, freight 38,570 lbs.

MANCHESTER—LONDON—ROTTERDAM—AMSTERDAM—HANOVER—BERLIN :
Daimler Airway, machines 16, passengers 9.

PARIS—LONDON :
Air Union, machines 11, passengers 18, freight 7,291 lbs.

LONDON—ROTTERDAM :
K.L.M., machines 12, passengers 15

SPECIAL MACHINES : 0.

Total number of trips by British machines : 46, carrying 70 pas. Foreign machines : 23, carrying 33 passengers

COMPARATIVE FIGURES :
For week ending Feb. 10 :
Machines, 69; Passengers, 103; Crews, 107; Total personnel 210.
Corresponding week, 1923 :
Machines, 50; Passengers, 144; Crews, 87; Total personnel, 231.
Corresponding week, 1922 :
Machines, 54; Passengers, 92; Crews, 87; Total personnel, 179.
Corresponding week, 1921 :
Machines, 22; Passengers, 25; Crews, 27; Total personnel, 52.

Croydon Notes.

Things at Croydon have been proceeding much as usual. The passenger traffic maintains its level and the freight figures show a steady increase. The only blank day last week was Sunday and on the remaining days practically all machines ran to schedule.

The D.H.34 with bigger wings which will give a slower landing and taking off speed will shortly be on the service of the Daimler Airway. Such a machine will have a big advantage over the present machines in the case of a forced landing on the Manchester route or on the difficult part of the route in Holland and Germany.

One of the most remarkable machines of the day is the old Instone Vickers Vimy G-EASI. This machine first came on service in June, 1920, and, with a few lapses, she has been running steadily ever since. It is now some three years since those famous week-ends when she used to carry 500 passengers in an afternoon giving them short joy rides at 5s. per person piloted by Messrs. Barnard and Chattaway.

A number of people have been to the aerodrome during recent week-ends and there has been a distinct livening of joy riding by the Surrey Flying Services.

Over at the Aircraft Disposal Company Mr. Perry has been testing various Bristol Fighters. Owing to the weather the Cooper monoplane has not yet had any further tests.

Something of a record has been made by the Instone Air Line this week. They have carried on the Cologne route 38,570 lbs. of goods, which if one's mathematics are not at fault (which is unlikely) is more than 17 tons. The line have for long made a speciality of freight but this exceeds their previous best in the height of the season. Whoever is organising this particular department should be assured of a good post in the Imperial Air Transport Co., Ltd., if and when formed.

Brooklands.

The Renfrewshire Flying Services have been carrying passengers recently at Brooklands for 7s. 6d. per person for a short flight. The machine was an Avro, and Mr. Frank Neale was the pilot.

Air Routes through Switzerland.

The Swiss Air Office is examining the proposal of seven important foreign air transport companies to establish an international air service through Switzerland, using Basel, Berne and Zurich as landing places. The Handley Page Transport Company Ltd. has for some time operated a somewhat spasmodic service from London to these three places and the Air Union also runs a line to Switzerland. It has been known for some time that the Fokker Co. in Holland and the S.A.B.E.N.A. in Belgium and the German Aero-Lloyd have been making arrangements to connect up Switzerland by air with their respective countries. It seems probable that the other two countries concerned are Italy and Czecho Slovakia. Negotiations are in progress in regard to the establishment of the Lyons-Geneva and Lausanne air line and the suppression of the present air mail service from Paris to Lausanne.

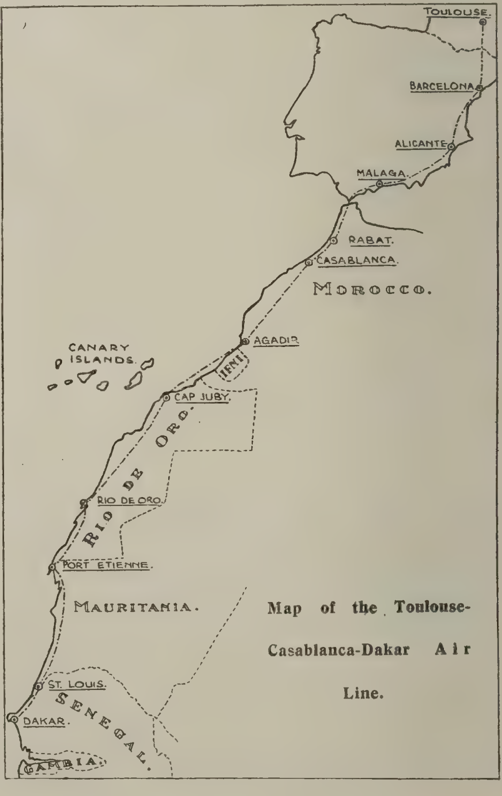
A Really Useful Air Service.

The scheme for an air mail service to link France and Dakar, the most Westerly port of the Continent of Africa, the organisation for which has been proceeding for some time is shortly to be realised. It will soon be possible to shorten by several days the transport of mails and passengers between Europe and the Continents of the Southern Hemisphere. The new route is a very big extension of the existing daily service between Toulouse and Casablanca. The service is to be inaugurated in April from which date letters will be carried from Toulouse to Dakar and *vice versa* where they will connect at Dakar with mail steamers which will call by arrangement to leave or take up letters sent with a surcharge of two francs.

The French Air Ministry has been engaged since 1919 in considering the possibility of connecting Europe to the Southern Hemisphere by air as far as Senegal. Last Spring a flight to Dakar was carried out successfully and the Government then proceeded with the organisation of the route. Recently more preparations have been made and the French Government have now granted to the Latècoère Company 15,000,000 francs (£163,500) by way of a subsidy for the operation of the line.

The new route will make it possible for letters to be delivered in South America and South Africa at least nine days earlier than is at present possible and special arrangements have been made for mail steamers to call at Dakar. Allowing for equal saving of time in each direction the gain for correspondence between these Continents and Europe will be at least 18 days. At the present moment at least 360 tons of mail passes through Lisbon in the course of a month to and from America so that when the South African mail is also taken into account it is reasonable to conjecture that some 100 tons of mail a month may be expected once the air line is established and universally known. For the first period of its operations the company is preparing for at least three tons a month and is placing 60 Breguêt machines on the service with a further 60 in reserve. The utility of these machines has already been amply proved on the Toulouse-Casablanca air line and the branch to the North African towns.

The new extension follows the coast for a distance of 1,750 miles in which six aerodromes have been laid out. The aerodromes will be at Agadir, Cape Juby, Rio de Oro, Port Etienne, Mterert and Port Louis. The Casablanca aerodrome which hitherto has been the terminus will now be the headquarters and organising centre of the line. Judging from the success which the Toulouse-Casablanca route has had as a mail service in spite of the fact that it has had very little advertising it should with its immense saving prove an exceedingly profitable undertaking.



Map of the Toulouse-Casablanca-Dakar Air Line.

The Australian Journal "Aircraft."

Owing to inadvertence an unfortunate reference to the Australian periodical *Aircraft* appeared in The Aeroplane of Jan. 30. It was stated that Mr. E. J. Hart, who has been responsible for the production of *Aircraft* had had "to close it down." The word "temporarily" was omitted. Publication has now been resumed and it is hoped that it will be possible shortly to make reference to the contents of the new numbers. Major F. A. de V. Robertson, the British representative of *Aircraft*, expects to receive copies of the current issues at an early date.

A South African Mail Service.

According to reports in the South African press, a scheme has been worked out for the operation of an air mail service between Cape Town and Pretoria by the South African Air Force. A plan has been drawn up which provides for a relay service operating over the 1,000 miles that separate these two towns, three aerodromes besides the two terminal aerodromes having been laid down in the scheme. The service would provide training and practice for the S.A.A.F. as well as accelerate the delivery and despatch of English Mail matter, which would benefit the Transvaal community to the extent of two days.

Italy and the Schneider Cup Race.

It is reported that the Commissariato d'Aeronautica has purchased some Rolls-Royce Eagle and Bristol Jupiter engines and also some Curtiss D.12 engines.

The Curtiss engines will be fitted in some seaplanes which will be entered for the Schneider Cup Race and in this connection it is interesting to note that wind-tunnel experiments are being made by the Commissariato d'Aeronautica with some models of newly designed seaplanes for this race.

From the above it can be seen that there is in Italy official recognition of the value of seaplane racing.

Any effort by Italy to bring the Cup back to Europe will have the good wishes of everyone concerned with aviation in this country.

British Aircraft for Spain.

After exhaustive practical tests the Spanish Naval authorities have decided to adopt British aeroplanes for service use. It is stated that by way of a start a dozen bombers will be purchased. A naval commission is coming to London for this purpose.

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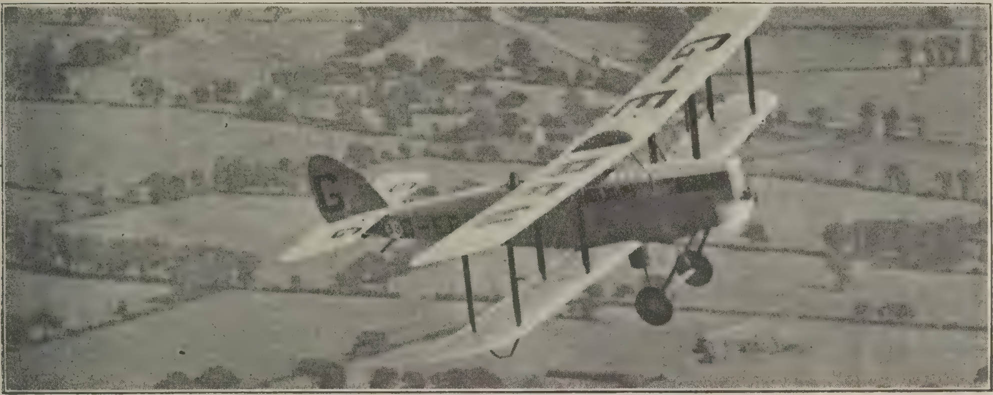
AN AERIAL HACKNEY CARRIAGE.



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ON AIR DEFENCE.

With a regrettable lack of consideration for those periodical publications which are published weekly on Wednesday His Majesty's "loyal and dutiful subjects" in the House of Commons have decided to bring the question of air defence into debate on the day on which this news sheet goes to press. Thus no account of the Government's aeronautical intentions can be given in the present issue. It would appear that a superficial survey will be made of the entire field of practical aeronautics—from the prospects of the Burney airship scheme to the defence of this country against aerial attack. Yet one can forecast with some assurance that one important section of the air defence problem, that of ground defences, will receive scant attention if any.

Despite the periodical panics which, too often, owe their inception to a desire on the part of the cheaper newspapers to fill the void which a lack of timely and intricate murders causes on occasion, the aerial side of air defence is at present in a state which, though not perfect, is at least superior in efficiency to that of any foreign nation. But air defence cannot be entrusted to aircraft alone. An elaborate ground organisation is essential. Guns, searchlights and sound locators must be supplied in adequate numbers—numbers which must be greatly in excess of those possible during the War 1914-1920. The elaborate network of communications necessary that each part of the defence organisation shall work with precision and promptitude cannot be improvised in a day. Nor should the installation of an operations headquarters—with all its complicated apparatus of control—be left until emergency produces the spur.

The War Office, hampered by lack of money and by the great reductions in the past few years, has been able to do little towards the development of an anti-aircraft organisation such as the General Staff would desire. For reasons of the economy the Army was forced to abolish the London Air Defence area. The guns have been removed from their sites, the searchlights are in store, the telephone lines have either vanished or are in civil use and the elaborate operations room—the product of careful thought and intensive practice during three years of the war—is no more. If any nation were able to attack this country to-morrow London and the majority of other vulnerable points would be defenceless.

With the means at hand the War Office has done its best. A Regular Anti-Aircraft brigade is in existence at Aldershot and in London there are two Territorial Army brigades, in both of which are artillery brigades and searchlight units. But recruiting has been so unsatisfactory that none of the Territorial units would be of sufficient strength to join in hostilities. And, most important deficiency of all, there is as yet no Headquarters Staff in being, ready to take over control when the necessity arises. In fact the Regular and Territorial units together would be insufficient to serve a single Army in the field.

Arrangements were made last year for the Air Ministry to take over the responsibility for air defence and in consequence an Air Officer will command all the Air Force and Army units set aside for this work. The Army will supply such ground defences as are required by the Air Staff. The Royal Air Force has now much of the popular appeal once possessed by the Royal Navy. The Air Minister has less difficulty in extracting money from Parliament than has the Secretary of State for War. Is it then presumptuous to hope that the Air Staff will realise at once how much the success of the squadrons set aside for defence will depend on the existence of an adequate anti-aircraft organisation on the ground and will in consequence, assist the War Office in obtaining such grants as will cover the cost of its important share in an essential work?

ON AN ANGLO-AMERICAN ENTENTE.

Whatever may be the political feeling between the United States of America and Great Britain or between the uninformed masses of the populations of those two nations there has never been any doubt about the cordial feeling between the chiefs of industry in America and in England.

Just before the change of Government in this country the Duke of Sutherland, then Under-Secretary of State for Air, paid a visit to the States. Shortly afterwards Major-General Sir Sefton Brancker, Director of Civil Aviation, also went to America. While he was still there the Chairman of the Society of British Aircraft Constructors, Mr. C. R. Fairey, C.B.E., also arrived and another English visitor was Squadron-Commander Bird, late R.N., a Director of the Supermarine Aviation Works.

According to American correspondents all these visits have had most favourable results. Of the Duke of Sutherland one writer says that he knows of nothing which has happened in aviation in the States for some time past that is comparable to the good which he did. When he landed the Duke gave out interesting facts to the press concerning British aviation. Thereafter he called on the President and not only created a pleasing impression personally but did American aeronautics a great service by letting the President see what was doing in England. One evening he delivered an address by wireless which address created a very friendly feeling. The writer of the letter says: "The Duke is what we call in this country 'a good mixer.' I do not know whether you know the term but it means one who mixes with people with a cordiality that makes for great popularity."

General Brancker naturally met all the important people concerned with aviation in the States and also delivered a broadcast address by wireless. His peculiar ability to combine humour and serious instruction in a well-delivered speech and his natural aptitude as a conversationalist still further enhanced the friendly feeling.

Of Mr. Fairey a correspondent writes: "He is not only one of the most attractive men I have ever met but is giving us information regarding the way you operate that will be more helpful than anything that has happened to us in a long time."

Concerning Mr. Bird the same correspondent remarks that there may be some criticism of his frankness in discussing our problems but that American aviation is now in a crisis and a discussion was needed to disclose the faults of the American system of dealing with manufacturers. Mr. Bird was asked to elaborate certain points which would be of help and he did so gladly and courteously.

This correspondent ends by saying: "The natural result of the visit from Mr. Fairey and Mr. Bird will be that your people can have anything you want from us. It is just this sort of friendly exchange that helps everywhere. When our people go over to England they will be under great obligations to render similar services which I know they will gladly give." One may add that when aeronautical visitors from America do come to this country it is to be hoped that they will be received and entertained in the same spirit and as generously as have been the British visitors to the United States.—C. G. G.

THE MOORING OF AIRSHIPS.

The recent adventure of the United States Naval airship Shenandoah which broke away from her mooring mast in a gale, despite the reassuring fact that although damaged the ship successfully rode out the storm and returned to its base, was regarded in some quarters as a serious reflection on the practical utility of the mooring mast.

And indeed if it should prove that such accidents are to be expected in really strong winds the practicability of such schemes as that for an inter-Imperial air service which has been prepared by Commander Burney would be seriously menaced. It is just in such winds that the airship cannot possibly be handled by any other method, and the failure of the mooring mast would go a long way towards relegating the airship to the category of a fair-weather craft.

The account of the accident which is published on another page makes it clear that the Shenandoah tore away from the mast as the result of the stripping of one fin which rolled the ship past the limit of free movement permitted by the mooring socket, and twisted the mooring gear out of the nose. Failure of fittings under such stress is by no means to be regarded as an indication that mooring in much stronger winds than that which caused the accident is in any way dangerous or impracticable. It suggests that possibly a modification of the mooring fittings themselves which will permit unlimited rolling may be desirable, but it cannot be regarded as showing that the airship is incapable of standing up to any normal mooring strain caused by the most violent winds.

THE WEST FRONT IN THE NEXT WAR.

By C. G. GREY.

Most thinking people of to-day who take any interest in World Politics and the intelligent officers of all the fighting services of all Nations have by now learned to accept the idea that before very long a new war must come upon us.

The less thoughtful and intelligent talk of a war between France and England for the supremacy of the air, or of a war between an exasperated Germany backed by Russia, against a domineering France assisted by the Czecho-Slovaks and Jugo-Slavs (otherwise the Little Entente) to whom France has been lending large sums of money with which to buy arms and munitions of war from French manufacturers. The more far-seeing look for the real race-war between Civilised Europe West of Warsaw and the Barbarians East of Warsaw—call them Turanian, Mongoloid, Japhetic or Yellow peoples as you will.

Such a war will be nothing new. It will be only a part of the great race-war which has been waged with brief intervals for some thousands of years. As Major L. V. S. Blacker indicated quite clearly in his book *On Secret Patrol in High Asia*, the War 1914-18 was working itself out on racial lines at the finish, and it may be taken that these subsequent years of devastating peace are only a breathing space in which the nations may rearrange their sides, so to speak.

THE RUSSO-JAPANESE ALLIANCE.

It has been stated hereinbefore that a Russo-Japanese *entente* already exists. In due course this will probably ripen into a definite treaty or alliance, as did the entente between the British Empire and the French Republic. It is at any rate believable that if France had been a monarchy instead of a republic England and France might still be on terms of a cordial understanding instead of being as we have been since 1922 in a condition of strained relationship. A cordial friend is much more pleasant than a strained relation

Republican France after the Revolution of 1789 had not a friend in the World except the distant United States of America and even then American friendship was chiefly based on sentiment raised by a Royalist the Marquis de Lafayette, who was for a while a philosophic democrat and reverted to royalism in his more mature years. It was not till the Emperor Napoleon arose that France acquired any real friends. It is true that these were ultimately estranged or lost by Napoleon's hunger for conquest and by his ultimate defeat. But it is particularly noteworthy that the Kings and Kingdoms of Saxony and Wurtemburg stuck to their alliances with him almost to the very end and fought stoutly with France against the combination of Russia and Prussia.

Herein are two noteworthy facts. In the first place monarchy made firmer the alliances between France and the West German Kingdoms and in the second place the instinct of the West Germans, largely Frankish and entirely Nordic, was to fight alongside the Frankish and Mediterranean French against the Mongoloid Prussians (or Bo-Russians) and the assorted hordes of Muscovites and Tartars and Mongols who came with them. (Parenthetically,—It is highly educative to read the Erckmann-Chatrian series of tales, The Conscript, Waterloo, The Great Invasion and others to get some idea of the feeling of the Alsatian peasantry when over-run by those Japhetic hordes.)

Thence we can derive two quite distinct ideas. One is that a Russian Emperor may make a firmer alliance with the Japanese Empire than would be possible for a Soviet Republican Government. The other is that we may find when the time comes a new grouping of power in Central Europe, namely an absorption of Mongoloid East Prussia by the Russians and a firm alliance of the West Germans with England, the Scandinavian nations, Holland and Belgium, which would be racially the most natural alliance in the World and a very useful balance of Power in Europe

If only the Western German Kingdoms, Bavaria, Saxony and Wurtemburg and the various Principalities could be set on their feet again under their hereditary rulers, with a German Emperor (say King Rupprecht of Bavaria the gallant brother of the gallant Queen of Belgium) at their head they would form a most valuable asset to Western Civilisation. But a really close alliance of all the Western Nations is necessary if our civilisation is to stand.

The League of Nations is supposed in theory to assure the safety of Europe, but the little affair with Turkey in 1923 showed that nations which are not directly interested in a dispute between other nations will not go to the expense of providing fighting forces for international police work. Also the League of Nations is powerless unless Germany, the United States and Russia are included. Germany is kept out by French hatred. The States keep out because they cannot yet see that Europe's affairs are America's affairs. And Russia as the natural enemy of all the white people should never be allowed into the League, although without Russia and Japan and China it would not be truly a League of Nations.

A NEW PROPHET OF WAR.

The Russian danger is clearly seen in a book entitled "Pan-Europa" by Richard N. Coudenhove-Kalergi published in 1923 by the Pan-Europa Verlag of Vienna. Dr. Coudenhove-Kalergi (whom one would judge by his name to be a Dutch Hungarian) says that a League of European nations and not The League of Nations is necessary to the salvation of Europe. And curiously enough he excludes from the European League both Great Britain and Russia.

According to him the power-groups fall into five categories, American, British, Russian, East Asian and European, with their centres or capitals respectively in Washington, London, Moscow, Tokio and Paris. And when one comes to consider the question his grouping seems fairly rational; but for the fact that one can hardly imagine Europe being governed from Paris as the United States are governed from Washington or as in effect the British Empire is governed, led or influenced from London.

Geneva or Rome would seem more possible capitals, the former as being so very neutral and the latter as holding a great tradition. But the Hague as having been the centre of so much international diplomacy might be more acceptable than either. Holland played a great part in the War 1914-18: much greater than most people know. The Dutch are a steady-minded nation with whom all Europeans can co-operate amicably. They are happily without the volatility of the Latins or the heaviness of the more essentially Teutonic people. Also the Hague is easily reached by rail or water or air from all parts of Europe and so is better placed geographically to be an international capital than is either Geneva or Rome. And furthermore Holland, because of her East Indian possessions and oil-fields, will be of much greater importance in the Great Race War than her size and population in Europe would suggest to those who have not hitherto considered the problems of such a war.

However, to return to Dr. Coudenhove-Kalergi.—In his view a European Union will occur either voluntarily by the creation of a Pan-European federation, or it will be forced upon Europe as a result of a conquest of Western Europe by Russia. He says that the present European system of small nations cannot maintain itself permanently in the face of four great federations of the future: the British, Russian, American and East Asian.—Which recalls Mr. Winston Churchill's remark a few years ago when he described Europe as being "Balkanised, such of it as is not Bolshevised."

He continues :—" If Europe would but form a union while there is yet time she might yet participate in the division of the earth as the fifth great factor, enjoying rights equal to those of the other four; but if she remains cut up into small pieces, she must needs sink deeper and deeper into political powerlessness until some day, having lost her colonies and having fallen into bankruptcy, misery and debt she falls a prey to a Russian onslaught."

THE FALLACY OF THE LEAGUE OF NATIONS.

Dr. Coudenhove-Kalergi is eminently sound on the subject of the League of Nations and exposes fallacies which underlie its structure. He points out that it enables nations remote from Europe and in no wise entitled to a voice in purely European matters to concern themselves with such matters.

He says :—" Instead of combining the peoples and countries of the world according to their historical, economic, cultured, and geographical relationships the League puts together mechanically like so many bricks, big and little, Asiatic and European, neighbouring and remote nations. Within the League Switzerland stands in no nearer relationship to her neighbour the Republic of Austria than does Siam or Ecuador.

" The basic error in the structure of the Geneva League of Nations is its abstractness: owing to that it has no concrete being and awakens no sympathetic echo in the human race, which step by step, starting with the family, has passed from the conception of the nation and the group of nations to the ideal union comprising the entire world. The League of Nations ignores these gradual stages of development; it ignores the Pan-American organisation as well as the Pan-European. Since it strives to be everything it is nothing. An alliance composed of three small nations such as the Little Entente is a more powerful factor in Europe to-day than the League of Nations."

AMERICAN-BRITISH INFLUENCE.

He is also concerned with the relationship between the Pan-American organisation and his Pan-European scheme, for

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Diseñadores y constructores del tipo Fairey III. Serie de aparatos suministrados en grandes cantidades al Gobierno Británico, durante la guerra y después de su terminación. En esta serie de paratos, el fuselage, el plano central y la unidad de la cola, son de tipo normal y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para los fines particulares a que se destina el aparato en cada caso. Todas les máquinas de este tipo, tienen alas plegadizas y están provistas del dispositivo patentado de combeo variable Fairey que da una alta capacidad y potencia de ascensión combinada con una velocidad baja de aterrizaje.

he writes "Pan-America is for Pan-Europe either the greatest danger or the greatest hope." He says that Europe and America must develop side by side in friendship or else that Europe, if she escapes military conquest by the Russia of tomorrow, will become economically enslaved to America. America owes her unparalleled progress to her unitedness; Europe her unparalleled downfall to her lack of unity.

As to the British Empire he says that it may in future be a most useful link between Pan-America and the new Pan-Europe. Extending as it does over all five continents of the earth it might be a powerful factor in preserving world peace. —which is to say that the British Empire would in fact hold the Balance of Power to a great extent: though according to one's own ideas British weight in the balance would not prevent a war between Europe and the Russo-Asiatic groups but would only in fact help the Pan-European League to defeat the attack of the two groups of Yellow people. The Pan-American group would be already engaged on the Japanese end of the Russo-Asiatic group.

The War Cloud.

On the probabilities of war Dr. Coudenhove-Kalergi is very sound. He says that though France may succeed in annihilating her great rival Germany she will have only a short time in which to gloat over her victory, for that very victory will leave her utterly exhausted and doom her to defeat.—One believes that Germany is in fact far from being annihilated to-day, whereas France is now, at the beginning of 1924, on the very edge of national bankruptcy. And one believes that if France does continue to goad Germany to desperation the result will be a heavy defeat for a France without allies.

Dr. Coudenhove-Kalergi argues that the "World War" only weakened Europe, whereas the war of the future will give her the death-blow. Berlin and Paris would suffer the fate of Babylon and Nineveh, "Be the outcome of a future European war what it may," he says "but one real victor can emerge from it—Russia—Europe's suicide is preparing the way for a future Russian invasion.

"Germany and France will emerge from the fearful crisis in which they find themselves at present either as European allies or leaping at each other's throats they will bleed to death from the wounds which they will inflict on each other."

The Fallacies of Pan-Europa.

Now it is just here that one disagrees from Dr. Coudenhove-Kalergi. He believes that the Pan-European League can be formed by conferences and by obligatory treaties and guarantees of security and all the old-fashioned methods and formulæ of diplomacy tricked out in a new guise. He believes in the possibility of a United States of Europe built on the pattern of the United States of America. He apparently omits to reckon on the tribal differences between Franks, Germans, Scandinavians, Slavs and Anglo-Saxons, and the still greater differences, almost amounting to racial differences, between the Nordic tribes and the Mediterraneans, or as we call them Latins, though the Latins are only a section of the greater Mediterranean peoples.

There is not the same difference between citizens of Seattle, Wash., and of Marblehead, Mass., and of San Antonio, Tex., U.S.A., as there is between the citizens of say Huelva (Spain), Brindisi (Italy), Haarlem (Holland), Nice (France), and Königsberg (Germany). In fact there is more difference between a citizen of Lille and one of Marseilles, both in France, than there is between the Californian and the New Englander though the latter are farther apart geographically than any two dwellers in Europe can be.

Thus the idea of a voluntary United States of Europe is practically impossible. Nevertheless a permanent Pan-European Alliance may be brought about for purposes of self-defence. But it can only come after an attack from the East has made it painfully evident that such an alliance is necessary for self-preservation.

The Voice of Experience.

Dr. Coudenhove-Kalergi, living as he does in Austria, has the outlook of the proverbial "toad beneath the harrow" and knows "exactly where each tooth-point goes." He is so far East as to see at close quarters the rise of Russian military power, and he probably saw during the War 1914-18 what a Russian invasion would mean to European Civilisation. He knows that Poland and Roumania and Czecho-Slovakia and Jugo-Slavia could not put up any defence against a Russian onslaught.

How much such nations would be worth as a barrier may be judged by the famous story of Buddenyi's Red Cavalry in the pantomime war against Poland in 1921. A few squadrons of Buddenyi's men seeing that their Polish prisoners were better fed than they themselves conceived the idea that they would be more comfortable as prisoners in Poland than as victorious soldiers of the Soviet, so they made up their minds to surrender to the first Polish army they met. And, such was the terror inspired by Buddenyi's name that it took them three weeks of hard riding before they could find a Polish force which would stand still long enough to let them explain that they wanted to surrender.

Thus it may be judged that before any Pan-European League can be formed in self-defence the invading Russians will probably be close to the gates of Vienna, as were the Turks in the 15th century. That Turkish invasion was turned back by the valour of the Teutonic Knights. And it seems probable that the next Turanian (or Japhetic or Mongoloid) invasion will be stopped similarly by Nordic strength.

The Germans, Scandinavians and Anglo-Saxons in alliance will probable hold a line roughly from Dantzig to the North frontier of Switzerland. And the Mediterraneans or Latins, which means practically the French and Italians, will close the passes to the South of Switzerland and hold what was the old Austrian-Italian fighting line during the War 1914-18.

One proposes in future articles to discuss operations along and over these two lines, which will form the West Front in the next war.

(To be continued.)

LT.-COL. J. L. TRAVERS.

James Lindsay Travers, O.B.E., Lieut.-Col. late R.A.F., Post-Captain, Chilean Navy, who was killed in the accident to the monoplane of his own and Major A. Q. Cooper's joint design at Croydon on February 14th, was one of the pioneers of aeronautics in this country. Trained as an engineer he early took an intense interest in flying. In 1910 he designed and built a three-cylinder rotary engine and fitted it at Eastchurch into a curious tubular monoplane on which it was intended that the pilot should sit astride. After taking the Royal Aero Club Certificate No. 86, at the Grahame-White School at Hendon on May 16, 1911, he was for some time at the works of Short Bros. at Eastchurch. During the summer of 1912 he carried out a tour organised by the *Daily Mail* of the South coast on a Farman float seaplane.

In February 1913 he was gazetted as Sub-Lt. R.N.R. and appointed to the R.F.C. Naval Wing, and in July 1914 he was appointed Flight Commander, R.N.A.S.

At the outbreak of war Flt. Commander Travers was stationed at Calshot Air Station. He then went to Hendon, and later to Felixstowe, and about the end of 1915 he was appointed to the Technical Department, Air Department, Admiralty, and in 1916 as Squadron Leader to the Command of the Test Depot, Isle of Grain. During 1917 he was promoted to Wing Commander and appointed to the Air Board —shortly to be turned into the Air Ministry—and there remained until his demobilisation during 1919. After demobilisation he was for a period employed in the Department of Civil Aviation as Director of Technical Information.

In 1921 Col. Travers was appointed Technical adviser to the Chilean Naval Air Service, with the rank of Post-Captain in the Chilean Navy. During his service in Chile he was responsible for the training and organisation of that service which he brought to a high state of efficiency, and had carried out experimental work concerning the use of large flying boats at sea which may have a very important bearing on the future developments of naval air power. He returned to England on a visit early in January.

At the time of his death Col. Travers was still in the service of the Chilean Government and engaged in negotiation for the construction of new aircraft for the Chilean Navy to specifications based on the result of his two years' experience with seaplanes on the Pacific Coast.

The machine on which he was killed was designed by him in collaboration with Major Cooper before Col Travers departed for Chile and was built by Major Cooper. The machine was completed shortly before his return to England, and had been flown for straight flights by several pilots, the very unfavourable weather conditions preventing more extensive tests.

After having on previous occasions made straight flights himself, Col. Travers felt sufficient confidence in the machine to make a more extensive flight on the morning of the 14th. In the course of this flight the machine at a height of some three hundred feet dived into the ground, and Col. Travers apparently was thrown out shortly before the machine reached the ground. The machine is reported to have "hunted" considerably during its flight, and it does not appear to have "spun."

"Jim" Travers as he was known to all his friends was liked and will be mourned by all who had ever met him. A fervent believer in the value of aircraft and particularly of sea-going aircraft, a competent engineer and a very sound and experienced seaplane pilot, Travers possessed qualities not commonly to be found in one individual.—W. H. S.

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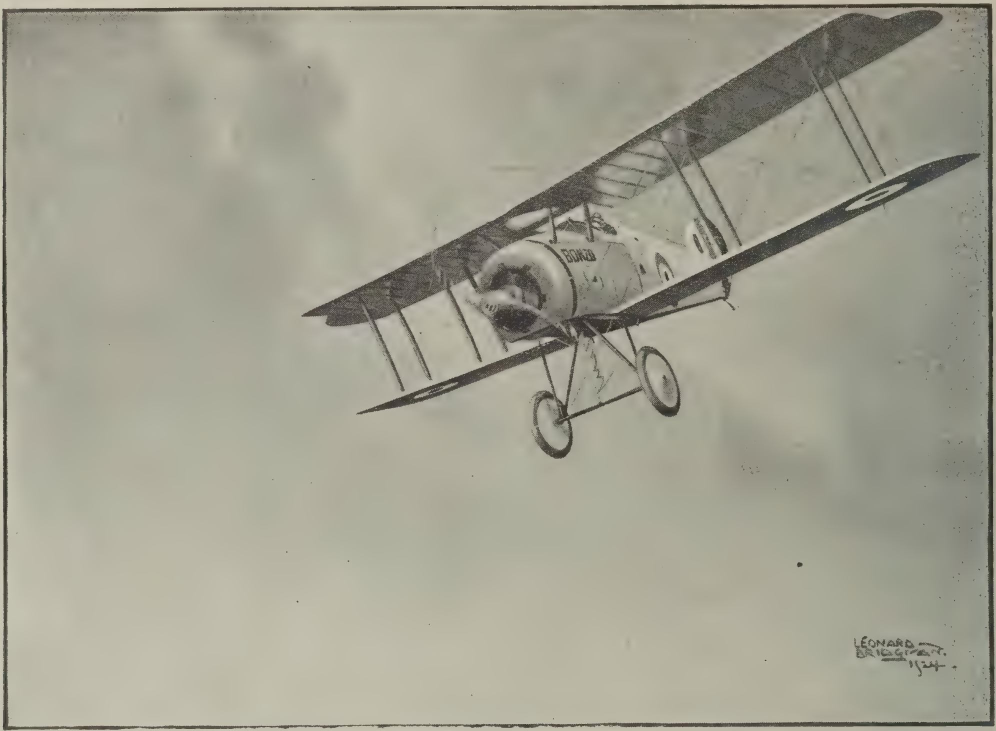

A BRITISH FIGHTER :—A Sopwith Snipe (BR2 engine) drawn by Mr. Leonard Bridgman. This is still a standard fighter in the R.A.F. though designed in 1917. This particular Snipe " Bonzo " took part in the last R.A.F. Pageant.

Lord Thomson of Cardington.

It is announced that the title of the Secretary of State for Air on whom the dignity of Baron of the United Kingdom has been conferred has been gazetted as follows :—

Baron Thomson of Cardington in the county of Bedford.

The Under-Secretary for Air on Aeronautics.

The following is extracted from The Times of Feb. 13 :—

> Mr. W. Leach, Under-Secretary for Air, speaking at Keighley on Feb. 10, said that surprise might be expressed at such a pacifist as he being in that office. The business of the Air Ministry was becoming more especially a question of fostering civil aviation and giving aviation every chance to promote the comfort and convenience of people. The Labour Government would endeavour to persuade the nations of the world that the use of air forces to make war more brutal and slaughter easier was something to be discouraged. Efforts would be made towards seeking a common agreement not to use a beneficent discovery for such unworthy purposes. The speaker said that his reception by the skilled permanent officials had been all that a Labour Minister could hope for.

The Schneider Cup.

The National Aeronautical Association of the U.S.A., the holder of the Schneider Cup, has informed the Royal Aero Club that the race this year will be held at Baltimore, Maryland, on Oct. 24-25.

The Shenandoah's Polar Flight.

It is understood that President Coolidge has issued an order prohibiting further preparations for the U.S. Airship Shenandoah's flight to the North Pole until Congress has made the necessary appropriation. This apparently ends the attempt for this year at least. The nominal reason is that the President wanted to feel sure that the proposed voyage of discovery or annexation had the approval of Congress. Actually it is believed that the President saw the wisdom of not further irritating Congress at a time when the Secretary for the Navy, Mr. Denby, is under a cloud. Congress would undoubtedly severely criticise Mr. Denby when the Naval Appropriation Bill came up in the House.

Air Union Rumours.

It was reported in the French press last month that the Air Union has ceased to exist and that a new company has been formed to replace it.

The Chairman of the new company is M. Jacques Level and MM. Louis Blériot, Louis Breguet and Caudron are directors. The new company will operate the Paris-London service and the Farman Co. will operate the Paris-Brussels-Amsterdam route.

The Loss of the Dixmude.

The Special Commission of Inquiry into the loss of the Dixmude over which Marshal Fayolle presided has delivered its report to M. Raiberti, Minister of Marine. After a long conversation with M. Poincaré he decided that its contents should not be made public until it has been submitted to the next Council of Ministers.

The Stolen French Aero-Engine Designs.

With reference to the reported theft of aero-engine designs from the Breguet Works it is now announced that the plans have been examined by the French military authorities and are declared to be of importance to the national defence. Antoine Thivat, a draughtsman at the Breguet works, and a Russian named Mindiouk, who are under arrest charged with the theft, will now be prosecuted on a charge of espionage.

The Italian Air Service and Foreign Purchases.

At a meeting of the Italian Supreme Committee for Aeronautics held on Dec. 16, 1923, Signor Mercanti, Director of Civil Aviation, dealt with the financial situation in regard to the estimates for 1923-4 and the programme of construction drawn up for the period ending June 30, 1924. Emphasis was laid on the need arising after comparison with the equipment of the British, French and American Air Forces, for a rapid increase in and improvement of aeronautical *matériel,* and the Committee unanimously approved the step of having recourse to foreign firms in cases of excessive delay by Italian firms in the production of machines which had passed the experimental stage and had been ordered for some time.

Signor Mercanti also referred to the serious problem of engine design and supply and expressed the hope that the national industry would soon be able to cope with the needs of the Air Services.

A Long Spanish Flight.

At the beginning of the year, a long flight from Spain to the Canary Isles was arranged presumably in connection with a projected air line which it is proposed to run on this route.

Four machines, a Dornier Wal and three Breguet biplanes piloted by Capts. Franco, Estevez, Pardo, and Lieut. Pizon, were employed.

On Jan. 3 the Dornier left Melilla for Cadiz and on the 6th it left Cadiz for El Araish where it was joined by the three Breguets. All four machines here took in sufficient food for eight days and guns and ammunition and then departed for Casablanca where they arrived the same day.

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Saturday Review, 1/9/23.

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On Jan. 7 the four machines left for Mogador the Dornier at 13.15 hours, the first Breguet at 15 hours and the second Breguet at 16.30 hours. The third Breguet had engine trouble at Safi but apparently rejoined the rest later. Here a strong wind sprung up which interfered with the flight for some days, the only excitement during this period being the efforts to get the Dornier into shelter inside the harbour on the 8th.

On Jan. 14 the three machines departed for Cape Juby, one machine being slightly damaged on landing. From the 14th—18th the time was occupied in giving the machines overhauls, repairing slight damages and giving exhibitions, while waiting for the Dornier (which was held up at Mogador by a heavy sea), to turn up, which it did on the 18th. On the 19th the four machines flew to Las Palmas in the Canaries where flying demonstrations were given before the applauding populace. On the 21st further demonstrations were given in the afternoon, two of the Breguets being damaged in landing.

The Moscow-Konigsberg Air Line.

The following account of the work of the Deutsch-Russiche Luftverkehrs Gesellschaft in the years 1922 and 1923 has been communicated to The Aeroplane by courtesy of the Aircraft Disposal Company Ltd. :—

A comparison of the Service results of the Deruluft on the Moscow-Königsberg Air Line in 1922 and 1923.

General.

Stock of Aircraft.—The Company owns, as before ten Fokker F.III (360 h.p. Rolls-Royce engine) machines.

Line.—The Line is 1,200 kilometres (745 miles) long and leads via Kovno and Smolensk. In 1922 the machines landed on their journeys in both towns. The longest journey made without intermediate landing was over 580 kilometres (360 miles). In 1923 no landings were made in Kovno, so that a journey from Smolensk to Königsberg covering 820 kilometres (509 miles) was established. The whole distance of 1,200 kilometres (745 miles) is covered by the same aeroplane carrying the same crew.

Time Table.

Passengers leaving Moscow in the morning arrive in Berlin the following morning, after a total journey lasting 22 hours, of 1,800 kilometres (1,115 miles) after having arrived in the evening of the same day in Königsberg and spending the night in the express train from Königsberg to Berlin. In 1922 two journeys per week were made in each direction. From June 1, 1923, three journeys per week were made.

Performances.

(This table does not include the Winter flights on the Moscow-Königsberg route or the special flights made on other lines in Russia.)

(1) Kilometres flown :—192,680 kilometres (119,466 miles) (1922—152,980 kilometres (94,492 miles)).

(2) Number of journeys flown :—155 (96 miles) (1922—113 (70 miles)).

(3) Total cargo conveyed :—50,550 kgs. (111,220 lbs.) (1922—2,225 kgs. (4,895 lbs.)). Of which : Passengers : 352 (1922—286). Mail : 1,684 kgs. (3,705 lbs) (1922—1,047 kgs. (2,303 lbs.)). Goods : 22,466 kgs. (49,425 lbs.) (1922—18,298 kgs. (40,350 lbs.)).

(4) Net load :—As the quantity of fuel to be carried this year had to be increased on account of the distance covered, 820 kilos (1,807 lbs.), this was done partly at the expense of the net load. In the previous year 400 kilos (881 lbs.) of net load were calculated as the maximum load, and in this year 350 kilos (771 lbs.). The admissible net load has been utilised in this year up to 93.2 per cent. (1922 only 91 per cent.), whilst the total load of the machine was increased by 55 kilos (121 lbs.) in comparison with the previous year. As the full freight capacity cannot be used in a commercial line the results may be considered to represent the maximum.

(5) Reliability :—99 per cent. (1922—96.5 per cent.) of the flights provided for were made.

(6) Delays :—Of the 99 per cent. of the flights mentioned in par. 5, 8 per cent. (1922—12 per cent.) have been somewhat delayed on account of engine trouble, fog, counter wind, sudden illness of a passenger, etc. Only once was a machine damaged (1922—9).

(7) Accidents :—The Company has no accidents to record in the two years.

(8) Engine trouble :—This year engine trouble only occured twice, once through the breaking of an oil tube and another time through the breaking of a water cooling tube, both of which were probably caused by vibration, so that here engine trouble only occurred once in approximately 100,000 kms., and it must be specially noted that the engines worked under quite extraordinary conditions (802 kilometres (509 miles)) flight without landing, and then after a very short landing another 380 kilometres (236 miles). Aeroplane engines have never before been used in such conditions.

(9) Total flying performance :—Since the opening of the line the distance flown represents 383,000 kilometres (23,798 miles). On account of the better utilisation of the favourable air currents, the average speed was increased this year in comparison with last year by 2.5 per cent., that is to say, from 137 kilometres (85 miles) to 141 kilometres (87 miles) per hour.

(10) Maximum performances, 1923 :—(I) A flight from Königsberg to Moscow, 1,200 kilometres (745 miles), in 5 hours 25 minutes, without intermediate landing with 5 passengers, mail, and luggage, altogether 405 kgs. (892 lbs.) net load. Average speed 221 kilometres (137 miles). (II) Between July 3 and Aug. 25 flights were made over 54,000 kilometres (33,553 miles, (45 line flights), without any incident or delay, according to time-table, the length of line being 1,200 kilometres (745 miles) one of the two stages, being 820 kilometres (509 miles) long, utilisation of the load space up to 93.2 per cent., and average speed of 141 kilometres (80 m.p.h.) per hour, each flight having been carried out by the same pilot and machine.

Results of the Flying Season, May to November, 1923, on the Moscow-Königsberg Route.

Month	No. of flights	Percentage of completed flights	Passengers	Goods Kgs. (lbs.)	Mail Kgs. (lbs.)	Total Kgs. (lbs.)
May ...	21	100	30	3021 (6646)	164 (361)	6934 (15255)
June ...	24	100	53	3691 (8120)	229 (493)	7895 (17369)
July ...	28	100	62	3966 (8725)	374 (823)	8990 (19778)
August ...	28	100	60	3816 (8395)	323 (711)	8638 (18994)
September	32	100	82	4370 (9614)	339 (747)	10859 (23890)
October ...	22	96	45	3604 (7929)	235 (517)	7234 (15915)
Total :	155		352	22468 (49316)	1684 (3705)	50550 (111210)

[It is interesting to note that the Rolls-Royce engines which have been used with such conspicuous success on the Moscow-Königsberg Air Line were supplied direct from stock by the Aircraft Disposal Company Ltd.]

The Air Port of Konigsberg.

Königsberg has, since the end of the war, become of increasing importance as a link between Germany and Russia and as a junction for air communication. It is a receiving station for grain from Russia and recently the construction has been completed of two of the most powerful grain elevators on the Continent, each capable of storing 40,000 tons of grain. Five new air stations are in course of construction at Königsberg, one of which has factories attached in which Russian raw products are turned into manufactured articles for shipment abroad. The "Eastern Fair" is held about three times a year in Königsberg and 2,000 German, Russian and Baltic firms exhibit goods.

Daily aerial communication has been established with Riga, Memel, Warsaw, Moscow (*via* Smolensk) and Warsaw (*via* Danzig). A new line will shortly begin work between Königsberg and Kharkoff, Tiflis and Tashkent. Rumour also suggests the opening of an air line to Odessa and Angora.

Behind this air traffic is Deruluft (the Deutsch-Russische Luftverkehrs Gesellschaft) in which are combined all the principal German aviation firms except the Junkers company. In Deruluft the Soviet Government is represented by M. Davidoff, formerly Superintendent of Harbours under General Wrangel, and M. Gwaita, formerly an officer in the Russian Imperial Garde du Corps. They are assisted by M. Kaminski, who recruited in England for General Denikin.

The Constantinople-Angora Air Route.

The Air Mail Service to Constantinople and Angora was inaugurated on Thursday, Feb. 14. The machine used was a Junkers monoplane operated by a German concern. The company is working under an arrangement with a Turkish *concessionnaire*.

Air Operations in Iraq.

In the House of Commons on Feb. 14 in a written reply to a question by Mr. Lambert, Mr. Thomas, Secretary of State for the Colonies, replying for the Under-Secretary of State for Air, said that no bombs have been dropped for the purpose of compelling the payment of taxes in Iraq.

The R.A.F. Memorial Fund.

A meeting of the Executive Committee of the Fund was held on Feb. 6 with Lord Hugh Cecil in the Chair. The amount of the grants sanctioned by the Committee since Dec. 19 last was £719 4s. 3d., and the number of cases dealt with was 90. Parade service collections for the fund were made in all units of the R.A.F. at home and abroad on Armistice Day, £341 1s. 2d. being contributed.

The Committee considered an application from the Council of the Enham Village Centres for a sum of £500, to be expended by the Council on the erection of an R.A.F. Cottage at the Enham Village Centre, near Andover, and the grant was sanctioned on the understanding that this cottage, when ready, should always be available for the use of a man who has served in the Royal Air Force, and who is now, or may hereafter be, in training at the Enham Village Centre.

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THE ROYAL AIR FORCE.

London Gazette.

Feb. 12.

GENERAL DUTIES BRANCH.—The follg. Plt. Offs. on probation are confirmed in rank :—A. D. Baillie, R. H. Bibby, P. G. Chichester, J. W. Colquhoun, H. S. Dawe, D. E. Gain, D. E. Godwin, H. L. R. Gough, C Mackenzie-Richards, E. Martin, M.C., J. A. Mollison A. G. Moon, J. W. New, A. R. Perry, G. H. W. Selby-Lowndes, C. R. Troup, T R. Wheatley, E. C. A. Wing (Jan. 14); H N. Davies, H. M. S. Wright (Jan. 16); A. C. Addams (Jan. 17); H. D. Mitchelmore (Jan. 18); A H D Livock (Feb 13)

MEDICAL BRANCH.—J. J. Clarke is granted a S S. commn. as a Flt. Lt. with effect from, and with seny. of, Jan. 28; Flt. Lt. B. F. Beatson, D T.M., is promoted to rank of Sq. Ldr. on completion of 10 years' service (Jan. 31).

RESERVE OF AIR FORCE OFFICERS.—The follg. officers are confirmed in rank, with effect from the dates indicated :—Flg. Offs. G. Cameron (Jan. 16); A. O. Bigg-Wither (Jan 31); H. W. Owen (Feb. 7); J. C Houston, M.C. (Feb. 10). Plt. Offs. A. M. Dunlop (Jan. 16); E. D. Trask (Feb. 7)

Feb. 15.

GENERAL DUTIES BRANCH.—Flt. Lt. R. F. L. Dickey, D.S.C., is placed on half-pay, Scale B (Jan. 23); Flg. Off. F. W. Sinclair, D.F.C., is restored to full pay from half-pay (Feb. 5)

Appointments.

Week ending, Feb. 19.

GENERAL DUTIES BRANCH —Flight Lieutenants R. B. Mansell, O.B.E., to Aircraft Depot, Egypt, 1/2; C. A. Ridley, D.S.O., M.C., to R.A.F. Depot on transfer to Home Estab., 21/2; V. R. Gibbs, D.S.C., to No. 7 Sqdn., Bircham Newton, on transfer to Home Estab, 17/2.

Flying Officers A. E. Woodbridge, to No. 7 Sqdn., Bircham Newton, 25/2; G. C. Oldham, to No. 2 Sqdn., Andover, on transfer to Home Estab., 5/3; A. H. Stirling, to Signal Co-operation Flight, Kenley, on transfer to Home Estab, 9/3; H W. Taylor to R A F Depot on appointment to a S.S. Comn., 11/2; O. E. Carter, to Aircraft Depot, India, 29/12; J. A. Hollis and B. R. C. Coope, to No. 20 Sqdn., India, 16/1; A. F. James, to No. 27 Sqdn., India, 29/12; H. A. Boniface, to No. 27 Sqdn., India, 25/1; E. F. Colam, to No. 20 Sqdn., India, 25/1; E V. H. Hudson, to No. 208 Squadron, Egypt, instead of to No. 14 Sqdn., as previously notified, 1/2; M. C. W. C. Flint, M.C., to No. 5 Sqdn., India, 19/22.

Pilot Offs. L. G. Pinnell and B. H. Shaw, to No. 5 Sqdn., India, 29/12; A. S. Hutton and G. H. Rawlinson, to No. 60 Sqdn., India, 25/1

STORE AND ACCOUNTANT BRANCH.—Flight Lieutenant (Stores) A. G. Knight, M.B.E., to No. 2 Wing H.Q., India, 22/12. Flying Officers (Stores) E. V. E. Andrewartha, to No. 27 Sqdn, India, 22/12; E. W. Lawrence, to No. 56 Sqdn., Biggin Hill, 25/2; W. H. Bowden, to R.A.F. Depot, on transer to Home Estab., 22/1.

MEDICAL BRANCH.—Flight Lieutenant (Medical) A. E. Barr-Sim, M.B, to H.Q., Iraq, 27/1.

An Award.

The King has approved of the award of the Distinguished Flying Cross to Plt. Off. Nevill Vintcent, R.A.F., in recognition of gallantry and devotion to duty in Iraq. The London Gazette states that this officer, having been forced to land owing to engine trouble, beat off an attack by hostile tribesmen with great courage and determination.

[Mr. Vintcent was posted to No. 24 Sqdn. from the R.A.F. Cadet College on Aug. 16, 1922, and to No. 8 Sqdn., Iraq Command, on Dec. 13, 1922. He is the first Cranwell Cadet to win a decoration.]

The Regular Army and the R.A.F.

The following official announcement was issued on Feb. 13 :

The period of secondment of Regular Army officers to the Royal Air Force will in future be four years, including preliminary training. Officers seconded must have at least two years' commissioned service and be between twenty-two and twenty-eight years of age on the date of secondment. They will be required only for training as pilots, and those with no previous flying service will be preferred. Although normally officers will be granted temporary commissions they will be eligible for promotion on their temporary R.A.F. commissions during their period of secondment, and for selection for permanent commissions in the R.A.F. During their seconded service they will receive the R.A.F. rates of pay and allowances of their R.A.F. substantive rank, and the period of seconded service will count towards retired pay under the same conditions as if the officers had remained with the Army. They will wear the service uniform of the R.A.F. and the mess dress of the Army, and will receive a grant of £25 towards the cost of R.A.F. uniform.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Association Football.

R.A.F. v. CHARLTON ATHLETIC.—The R.A.F. drew with Charlton Athletic at Uxbridge on Feb. 6, four goals being scored by each side. Charlton opened the scoring of a hard and interesting game and it was not until after half-time that the Air Force recovered and took the lead, ACs. Patterson and L-AC. Dempsey scoring. Cpl. Weaver kicked the third goal and Flg. Off. Dickson scored with a neat header just before the finish.

The R.A.F. team were :—Flg. Off. G. A. Hadley (Spittlegate); Flg. Off. B. Williams (Cranwell), Sjt. S. Fretwell (Spittlegate); Sjt. R. Young (Spittlegate), Flg. Off. C. N. C. Dickson (Cranwell), Flg. Off. J. Spooner (R.A.F. Depot); Cpl. E. Francis (Cranwell), Cpl. A. E. Weaver (Halton), L-AC. W. Dempsey (Isle of Grain), AC. C. Patterson (Cranwell), Flg. Off. E. Martin (Duxford).

Hockey.

R.A.F. v. OXFORD UNIVERSITY.—Oxford University beat the R.A.F. at Oxford on Feb. 6 by 5 goals to 1. The Air Force team put up a better fight than the score suggests and Oxford's defence was severely tried. Oxford however were too strong for them in front of goal. Flg. Off. Gardiner scored for the R.A.F.

The R.A.F. team were :—Flt. Lt. Gilley (No. 2 Sqdn.), goal; Flt. Lt. L. Smith (Halton) and Plt. Off. Ronfell (No. 7 Sqdn.), backs; Sq. Ldr. Keeble (Isle of Grain), Flg. Off. Scott Davidson (Gosport), and Flg. Off. Smythe (Lee-on-Solent), half-backs; Flg. Off. Sawyer (Isle of Grain), Flg. Off. Bird (R.A.F. Depot), Flg. Off. Gardiner (Gosport), Flg. Off. Reeves (Gosport) and Flt. Lt. Wigglesworth (Calshot), forwards.

Rugby Football.

(UNOFFICIAL.)

R.A.F. v. R.N.—The Royal Navy beat the Royal Air Force at Twickenham on Feb. 13 by two goals and two tries (16 points) to two tries and a penalty goal (9 points). Group Captain H.R.H. the Duke of York honoured the game with his presence.

The keen interest in the game taken by the other ranks of the R.A.F. was shown by the fact that something like 1,200 of them turned out to support their team having apparently travelled in omnibuses from Uxbridge and other stations near London.

The ground was hard and dry and there was a stiff East wind. The game was won for the Navy by their three-quarter line who played brilliantly and were altogether too fast for the R.A.F.. The R.A.F. forwards although obviously much lighter than the Navy pack, more than held their own both in actual shoving and in the loose and entirely owing to their efforts under the leadership of Flt. Lt. Usher two-thirds of the game was played in the Navy's twenty-five. Usher himself did the work of two men.

Sq. Ldr. Russell at scrum-half worked the scrum wonderfully getting the ball again and again, but in spite of one or two fine individual breaks through his partner was slow off the mark and the three-quarters compared very unfavourably with their opposite numbers in the Navy team. Their tackling was particularly bad, it was frequently shoulder high and occasionally missed the mark altogether. The Navy's third try was a gift, the Air Force defence being tossed aside or left standing. It is extraordinary that the wonderful tackling which saved and won the game at Twickenham a year ago should be a lost art in the Air Force side this year. Cpl. Wale at full back put up a gallant show. His coolness and steadiness in fielding and the length and accuracy of his kicking drew as many cheers from the Navy's supporters as did Lieut. Stephenson's first great try from the R.A.F.'s supporters.

There was no scoring in the first half-hour of the game, most of the play being in the Navy's twenty-five, but a round of passing by the Navy backs gave the ball to their right wing, Stephenson, the Irish International, who scored far out after a dash of almost incredible speed. The Navy's second try was scored by George who cut in with a pass from the left wing and evading the R.A.F. full back scored near the goal, a try which was easily converted.

The third try early in the second half was practically a sprinting exhibition by Stephenson following a smart opening by Lee at left centre who scored the fourth try himself. With half-an-hour to play the Navy, beaten in the scrum, were leading by 16 points.

The R.A.F. were fighting every inch of the way and a short punt by Lowe followed by a scrummage near the line sent Isaacs over. The place kick from an awkward angle, failed. A little later Lowe got the ball again and swerving and side-stepping scored a brilliant try. A penalty goal kicked by Usher in the last five minutes finished the scoring of what must have been one of the hardest games played even at Twickenham.

The teams were :—

Royal Air Force.—Cpl. J. Wale (Flowerdown), back; Flt Lt. C. N. Lowe (Kenley), Sjt. Snaith (Duxford), Flt. Lt. O. C. Bryson (Cranwell), and Flg. Off. A. E. Forrest (Spittlegate), three-quarter backs; Sq. Ldr. J. C. Russell (Andover) and Flt. Lt. C. Medhurst (Air Ministry), half-backs; Flt. R. H. Usher (Northolt), Flt. Lt. J. Chick (Farnborough), Flg. Off. P Rose (Netheravon), Flg. Off. C. Adams (Netheravon), Flg. Off. F. Issac (Cattewater), Flg. Off. E. Wackett (Netheravon), Cpl. Johnson (Ruislip), and L.-AC. Collins (Duxford), forwards.

Royal Navy.—Lt. H. F. Harrison (R.N.C., Greenwich), back; Lt. H W. V. Stephenson (P.R.T. School, Portsmouth)) Midshipman T. S. Lee (R.N.C., Keyham), E.-R.A. George (H.M.S. *Vivid*) and Lt. W. G. B. Mackenzie (H.M.S. *Courageous*), three-quarter backs, Sub-Lt. W. J. Buchanan (R.N.C., Greenwich) and Lt. F. E. Chevalier (H.M.S. *Champion*), half-backs; Marine E. R. Gardner (H.M.S. *Defiance*), R.P.O. W. G. E. Luddington (H.M.S. *Vivid*), Lt.-Cmdr. R. S. Benson (H.M.S. *Excellent*), Lt. C. F. Hallaran (H.M.S. *Victory*), Lt. W. C. T. Eyres (H.M.S. *Vivid*) (captain), Lt. R. C. O'Conor (H.M.S. *Excellent*), Lt. D. Orr-Ewing (R.N.C., Greenwich), and Capt. L. Mercer, R.M. (R.N.C., Greenwich), forwards.

Referee, Mr. A. E. Freethy (Neath).

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MILITARY TYPES.

Type.	Engine.	Duty.
D.H. 9	230 h.p. Siddeley "Puma."	Bomber, Reconnaissance and Photographic Machine.
	350 h.p. Siddeley "Jaguar."	Reconnaissance Fighter.
D.H. 9a	360 h.p. Rolls-Royce. Mk IX. 400 h.p. Liberty. 450 h.p. Napier "Lion."	High Performance, Reconnaissance Bomber.
D.H. 38	450 h.p. Napier "Lion."	Long and short distance daylight Reconnaissance Bomber.
D.H. 49	360 h.p. Rolls-Royce. Mk IX. 450 h.p. Napier "Lion."	High Performance General Purpose Military Aircraft.
D.H. 53	6 h.p. (696 c.c.) Blackburne.	Light Monoplane for Training and Practice.

COMMERCIAL TYPES.

Type.	Engine.	Useful Load.	Cruising Speed.	Range.
D.H. 9c	230 h.p. Siddeley "Puma." Used on the De Havilland Aeroplane Hire Service and on the Seville—Larache (Spain), and Charleville — Cloncurry (Australia) Air Lines.	3 Passengers or 650 lbs Freight.	85-90 m.p.h.	500 miles.
D.H. 34	450 h.p. Napier "Lion." Used on the London–Brussels–Cologne, London—Amsterdam—Berlin snd other Air Lines.	10 Passengers or 2,450 lbs Freight.	105 m.p.h.	370 miles.
D.H. 50	230 h.p. Siddeley "Puma." Used on the De Havilland Aeroplane Hire Service. Winner of Traffic Competition, International Aviation Meeting, Gothenburg, 1923.	4 Passengers or 1,000 lbs Freight.	100 m.p.h.	400 miles.

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Type.	Engine.	Short Description.
D.H. 37	270 h.p. Rolls-Royce "Falcon."	Designed specially for High Speed Touring. Accommodation for two passengers with ample room for luggage. High Performance and long range.
D.H. 53	6 h.p. (696 c.c.) Blackburne.	Light Single-seater Monoplane. Top speed, 73 m.p.h. Landing speed, 33 m.p.h. Climb, 370 ft. per minute.

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THE ADVENTURES OF THE SHENADOAH.

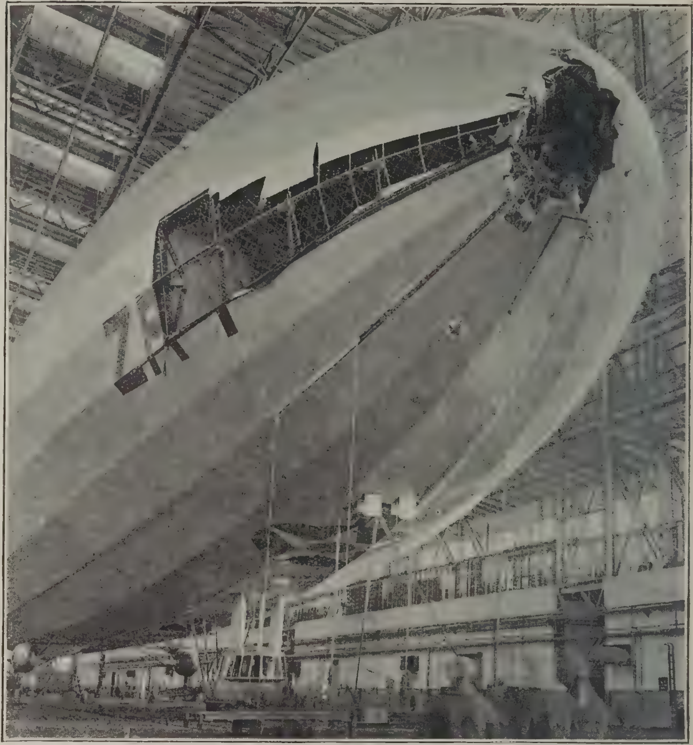
The photographs here reproduced showing the damage which occurred to the U.S. naval rigid airship "Shenandoah" on the occasion of the recent break-away from the mooring mast have been forwarded to THE AEROPLANE by Mr. G. W. Failam from the Naval Air Station at Lakehurst, N.J.

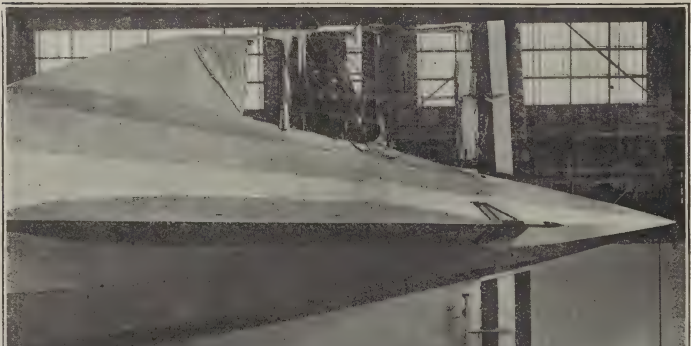
The airship was moored to the mast on Jan. 12 with the intention that she should remain out of the shed for a period of ten days, making daily flights and during that period tests of the stresses to which the ship was subjected at the mast in varying weather conditions were made. During the tests the maximum stress in the frame girders was found to occur at about 20 to 25 metres aft of the mooring cone, and the last reading made in a gust of 68 m.p.h. about 10 minutes before the ship broke away from the mast showed the stress to be less than one-third of the failing stress in the girder in which time it occurred.

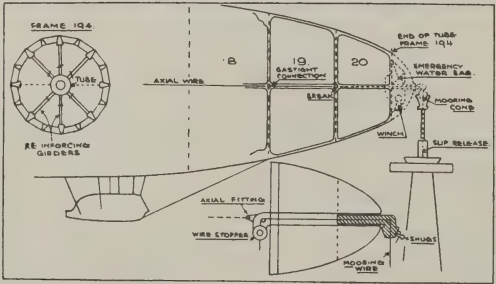
About midday on Jan. 16 the barometer began to fall rapidly and the wind increased from 27 m.p.h. at noon to 50 m.p.h. at 7 p.m., with gusts reaching to 70 m.p.h. At 6.52 p.m., in a gust of 68 m.p.h., accompanied by heavy rain the cover of the upper fin ripped, and caused a sudden rolling of the ship which twisted the mooring tube clean out of the framework of the ship, leaving the tube and a broken length of the axial cable at the mast.

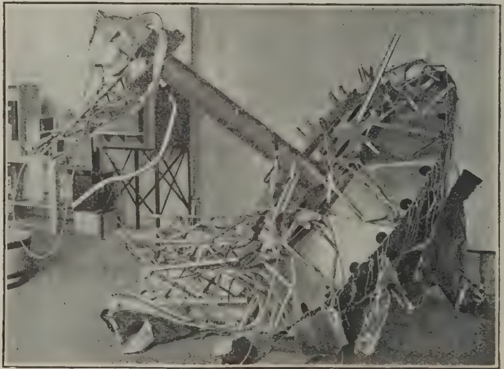
The cable in breaking ripped the foremost gas bag, and punctured the second gas bag, which emptied slowly during the flight. This second bag when deflated was used as a bulkhead to protect the third gas bag from the air pressure to which the damage to the outer cover would otherwise have subjected it. Immediately after breaking away two winches installed in the nose of the ship fell out.

Four engines were running within two minutes of breaking away, and three fuel tanks weighing 1,100 lbs. were dropped to restore trim, and for over an hour and a half the ship was blown backwards at about 25 m.p.h. At the end of that time it was considered that the remaining two engines could be started up without danger to the structure, and fortunately the wind began to drop and to veer from S.S.E. to W.N.W. It was thus possible for the ship to be flown back to Lakehurst keeping the nose practically into the wind for the whole journey, and by the time the "Shenandoah" reached her base the wind was blowing at 20 m.p.h. dead along the shed, rendering it a relatively simple job to land and house her.









The three photographs show the nose, the damaged top fin and the torn out nose-cap and mooring tube of the "Shenandoah." The diagram shows the arrangement of the mooring fittings and the position of the breakages.

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Curiously enough the girders of the upper fin whose striping was the cause of the incident, failed just as the ship was landing.

At the time the "Shenandoah" had nothing like her full crew aboard, but fortunately Capt. Anton Heinen, the old Zeppelin test pilot, and Lt.-R. Mayer, who had been intimately concerned with the detail design of the ship, were present. That the ship was safely navigated back to its base and housed without further damage must be regarded as a very great tribute to the skill of Capt. Heinen, who was greatly assisted in his task by the very detailed knowledge of the ship's design possessed by Lt. Mayer.

THE AIR-COOLED RADIAL ENGINE.

On Jan. 29 Mr. Roy Fedden read before the Scottish Section of the Royal Aeronautical Society a paper on Radial Air-Cooled Aero-Engines, in which the history of the type, its advantages, and the practical difficulties which have been encountered and overcome in its development were discussed in considerable detail.

Mr. Fedden pointed out that the air-cooled radial type is by no means an innovation, as over ten years ago several practical low-powered engines of this type were produced, and flown, but these engines failed to compete with the air-cooled rotary on the power/weight basis. By 1917, however, it became obvious that the air-cooled rotary type had reached the limit of size and power, and the development of fighting aeroplanes caused a demand for engines of increased power which possessed the rotary engine's characteristics of low weight and compactness.

This led in 1918 to great activity in the design of stationary air-cooled radial engines of 300-400 h.p. and engines giving extremely satisfactory power/weight ratios were produced as a result. Unfortunately serious mechanical failures occurred with these engines—so much so that it was not possible to put them into service, and the development of the type was seriously retarded and an impression that the stationary radial engine was inherently unsound was produced in many quarters. Nevertheless some people continued to have faith in the ultimate possibilities of the type, provided that the special problems which it raised were adequately studied, and as a result of some years of experiment this type is now a practical proposition, which compares in respect of life, reliability and fuel consumption with the best of water-cooled types.

The Advantages of the Air-Cooled Radial.

Without claiming that the radial type is unequalled for all types of aircraft, and admitting that the type in the long and tedious process of development has become somewhat heavier than was originally expected, Mr. Fedden expressed the belief that the stationary air-cooled radial would hold the field against all comers for the next ten years or so for some classes of Military and Commercial Aircraft, on the ground that a 400 h.p. production engine of this type was now 25 per cent. lighter than the best water-cooled engine of the same power, and during the next year the powerweight ratio of the radial would be improved by a further 15 per cent. or so.

The power/weight ratio of an aero-engine had always been of paramount importance and was even more vital in commercial machines than in military types. The aim of the engine designer must be first and always reduction of weight. Mr. Fedden believed that for powers up to 1,000 h.p. the radial air-cooled type offered the most promising field for weight saving and would continue to do so until some revolutionary change in the type of engine occurred.

Inertia torque caused by alternate acceleration of pistons and connecting rods, and the consequent alternations of stress in the crankshaft was one of the most radical defects of straight-line or Vee-type of engine. In the single-row radial where all connecting rods come to a common crankpin the transmission of these stresses through the crankshaft is avoided.

The air-cooled type dispenses with the whole water system of the water-cooled type. Failure of the water system is by no means unknown even to-day, and for some purposes the actual provision of water for cooling is a difficulty. The water-cooled engine cannot generally be expected to develop its full output until the cooling system has been warmed up. When it is necessary to leave the ground, or the deck of a ship, within a few seconds of starting the engine, the air-cooled type has an important advantage as it warms up practically at once

If the radiator of a water-cooled engine reaches a mean temperature of 80°C. the losses by evaporation become serious. In hot climates the difference in temperature between the air and the water may be greatly reduced, and very large radiators are necessary. The air-cooled engine runs satisfactorily if the mean fin temperature does not exceed 175°C. and consequently is little disturbed by the range of air temperature encountered in practice. In very cold climates the water-cooled engine presents serious difficulties—liability of water to freeze, etc.—which are not met with in the air-cooled type.

The radial air-cooled type is the shortest, most compact four-stroke engine that has yet been produced, it is simple to manufacture, has no large pieces difficult to pack or store. Except for the rotary the radial can be dismantled, overhauled and reassembled more rapidly than any other type, and is exceedingly simple to instal.

Special Difficulties of the Type.

The special problems which have in the past caused trouble with the radial air-cooled type are those of insufficient cooling, burning of valves and failure of valve gear, excessive fuel and oil consumption, unreliability of big-end bearing assembly, failure of crankshaft, and lastly, faulty installation.

Satisfactory cooling of large air-cooled cylinders has presented much difficulty. This has been overcome by patient experiment, and it is now possible to build cylinders which will maintain a B.M.E.P. of 125 lbs. per sq. in. for certainly 250 hours without breakdown.

Valve troubles have been overcome by careful design with the aid of improved steels for the valves themselves. Great trouble has been encountered from the difficulty of maintaining reasonably constant valve clearances with push-rod gear, but the temperature-compensating gear now used on Bristol engines has solved this problem.

Oil and fuel consumption troubles had been overcome by detailed improvements, and the radial now compared well with the water-cooled type.

The big-end assembly of early radials gave great trouble. These troubles were due to heavy loading of the bearing, heavy moving parts, lack of stiffness of bearing and crankshaft and unsuitable lubrication.

Mr. Fedden considers that the plain type of bearing is the best for radial big ends as it can be made light, the rubbing speed can be kept down, and the centres of the articulated rod pins can be kept near the centre of the crank-pin. By careful design of reciprocating parts, the use of special light alloys for pistons and by giving ample oil circulation satisfactory big ends had been produced.

Crankshafts should be as stiff and therefore as short as possible to avoid torsional oscillations. The desire to provide a nose to the crankcase in order to give good cowling lines had led in the past to prolonged airscrew ends on the shaft and had led to some trouble.

Faulty installation caused by failure to appreciate all the conditions had led to many troubles in the past. It is not enough to mount the engine so that an ample flow of air can reach the cylinders—the air must be able to get away also—which is not possible if the cylinders are close up to a bulkhead. The cylinders require to be evenly cooled, and very slight differences in the shape of cowling have sometimes had a remarkable effect on engine performance. Consequently careful experiments were necessary before deciding on a standard for cowling in any case.

For high-speed machines operating at altitudes some form of variable shutter cowling controlled by the pilot, together with a temperature indicating device was required. Spinners, though they added to the appearance of the aeroplane, are a constant source of trouble and of doubtful value for the improvement of performance. Oil temperature indicators and controllable oil coolers are desirable.

Both for the comfort of the pilot and to make night landing possible some adequate form of exhaust system is necessary. The design of a suitable manifold requires care.

Supercharging.

The air-cooled engine at altitude presents the same difficulties as to falling off in power as the water-cooled type Mr. Fedden considered that of the possible methods of supercharging, the exhaust turbine-driven supercharger gave the most promise. To obtain really satisfactory results the whole engine requires to be conceived as a supercharging unit from the outset. The extra weight for a supercharged 400 h.p. air-cooled radial was estimated at 15 per cent.

As an intermediate step to the supercharged type a high compression engine using alcohol at low altitudes and normal fuel high up seems promising. Successful tests with 7/1 compression and alcohol had already been made.

Summing up—although it was unwise to prophesy in such matters—Mr. Fedden believed that the static air-cooled radial had a remarkably bright future and that for some years to come it would have no serious competitor for use in :—(1) light aeroplanes with engines from one to two litres capacity, (2) training machines and the smaller passenger-carriers, (3) single and two-seater fighting machines, (4) deck-landing machines and the smaller type of float seaplanes, and (5) generally for all machines operating in either very hot or very cold climates.

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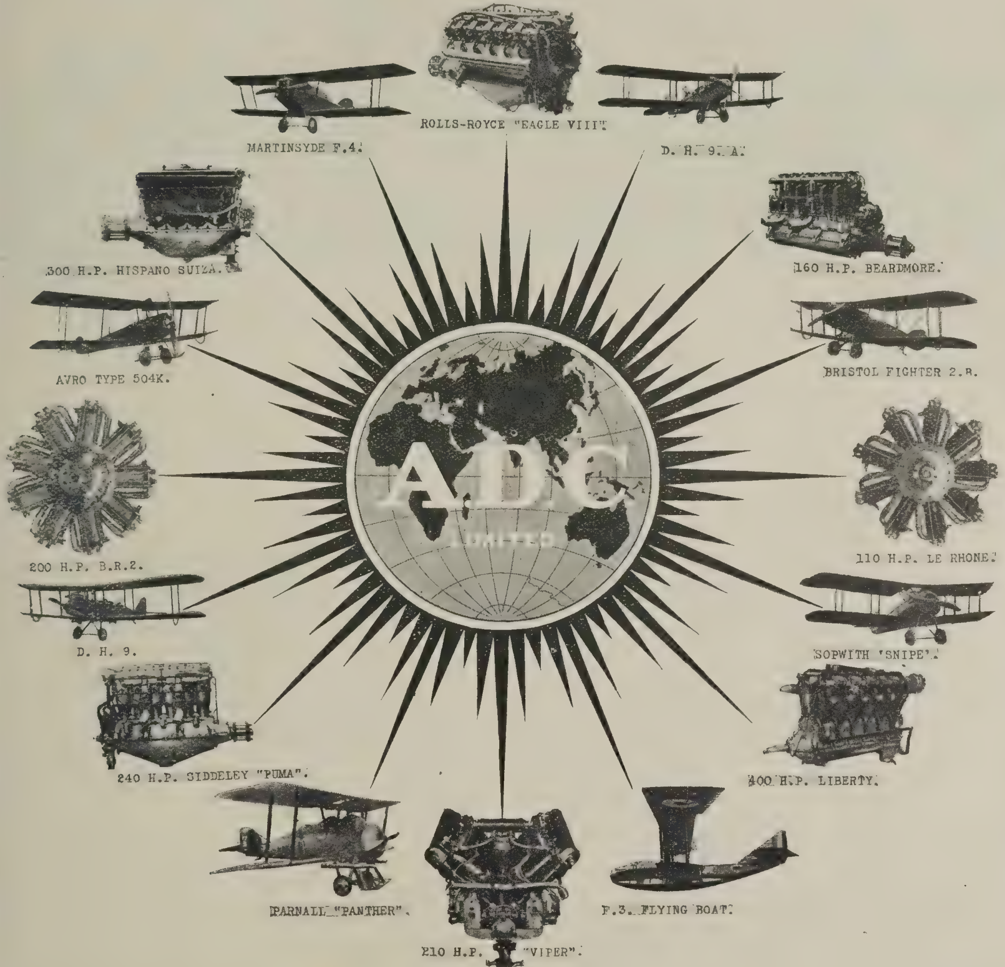
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A HEIGHT RECORD IN THE ARGENTINE.—A photograph of the Fokker C.D.1 biplane, fitted with a 450 h.p. Napier Lion engine, which as recorded in "The Aeroplane" recently has beaten the height record of the world for weight carrying. The machine, piloted by Herr Ballod, climbed to 21,500 ft. carrying a useful load of 1,100 lbs. The machine is the identical one which was flown by Mr. Fokker at Gothenburg last year.

Mr. Chadwick on Performance Analysis.

On Friday, Jan. 8, Mr. Roy Chadwick in a paper read before the Institution of Aeronautical Engineers described in some detail the methods practically used in an aeroplane design office for predicting the performance of an aeroplane.

Mr. Chadwick said that there were three main methods available. The first was based on curves showing the average performance attained from the analyses of tests of a large number of machines whereby one could determine at once the characteristic factors of wing loading and power loading which would enable a specified performance to be obtained—or alternatively, having decided on these two factors, the probable performance could be estimated.

The second method was that of a step by step estimation of the air forces acting on all the components of the machine in question, and the third that of testing a complete model of the machine in the wind tunnel.

In practice the first method was generally employed for preliminary work, and from its indications as to the necessary loading factors, and with the aid of data as to average weight factors for the various components of the aeroplane the essential features of a machine to comply with a given specification could be determined and a general arrangement drawing made.

Then the second more detailed analysis of performances could be made to check the preliminary estimate.

The third method was a possible substitute for this detailed analysis, but in general it could only be used in a few cases—generally speaking the machine was completed before the model tests were made.

To illustrate the first two methods Mr. Chadwick went through the whole process of the preliminary and the check performance estimate for a single-engine tractor biplane carrying 700 lbs. of useful load with a 360 h.p. engine, using in the process an extremely comprehensive series of classified data sheets and curves developed for use in the drawing office of A. V. Roe and Co. Ltd.

Mr. Chadwick was careful to point out that the use of this method of computing performance depended for its reliability on the discretion and the experience of the user, but that given those qualities it was quite reliable for any normal type of aeroplane.

The very complete series of curves and data which illustrated the paper should be of very great value to students of aircraft design when they are published in the Minutes of Proceedings of the Institute.

Fighting Agricultural Pests from the Air.

In a recent report issued by the U.S. Department of Agriculture it is stated that the experiments conducted in dusting cotton from the air has given very profitable results. It is known that the cotton boll weevil is responsible for the greatest economic disturbance in cotton-growing districts, all but 4 per cent. of the cotton crop now produced in the United States is in territory infested with this pest.

In tests carried out from the air over more than 1,000 farms have shown that by proper dusting of the fields with calcium arsenate 96 per cent. of the farmers were able to control the weevil so as to make the crop profitable.

In a comparison made on adjacent plantations those dusted from the air have shown an increase of 750 lbs per acre of seed cotton over fields not treated.

The cost of these experiments which have been carried out by the U.S. Army Air Service in collaboration with the Department of Agriculture has been estimated at about $5 (£1) per acre and at the present prices of cotton the gain from dusting was over $75 (£15) per acre.

Owing to the possibilities that have been opened up in this field, the Department of Agriculture has felt warranted in conducting experiments for the development of aircraft and equipment designed for this purpose, according as funds available permit.

In the Philippine Islands experiments of a similar nature have been carried out to combat the locust scourge which has done damage to crops in certain parts of the Islands. In this case calcium arsenate was dropped from an altitude of 15 feet, the airscrew blast acting as a distributor.

A sidelight to this experiment is that complaints have been received from the native population to the effect that all the grasshoppers have been exterminated and as a result their food supply has been cut off.

A Seaplane Height Record.

On Saturday Feb. 2 M. Maurice Hurel on a C.A.M.S. 36 bis flying boat (300 h.p. Hispano-Suiza engine) reached a height of 6,200 metres (20,336 feet) which beats the previous seaplane height record made by M. F. Laporte on an F.A.B. flying boat in December by 665 metres (2,181 feet).

The record flight was made at the French Naval Aviation Base at St. Raphael, and the machine used was one of the two C.A.M.S. boats entered for the Schneider Cup Race at Cowes last year.

This boat, although inferior in speed to the Curtiss seaplanes, demonstrated its excellent qualities piloted by M. Pelletier d'Oisy in the elimination tests, but was unfortunately prevented from taking part in the actual race through a collision with a buoy while taxying out to take off.

The pilot, M. Hurel, has already accomplished some good flights on C.A.M.S. boats, particularly the double crossing of the Mediterranean on a C.A.M.S. 33 in 18 hours with one landing for fuel, and a single non-stop flight from St. Raphael to Bizerta, in 6 hrs. 7 mins. Previous to joining the C.A.M.S. firm M. Hurel was chief seaplane test pilot at St. Raphael.

M. Laurence Santoni is to be congratulated on the latest accomplishment of one of his productions and more particularly in obtaining the services of M. Hurel for proving the excellence of M. Conflenti's design and the C.A.M.S. construction.

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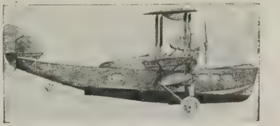

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 4; Tuesday, 0; Wednesday, 1; Thursday, 12; Friday, 16; Saturday, 15, Sunday, 2.

LONDON—PARIS—ZURICH:
Handley Page Transport, Ltd., machines 7, passengers 41, freight 4,794 lbs.
LONDON—OSTEND—COLOGNE:
Instone Air Line, Ltd., machines 14, passengers 20, freight 15,288 lbs.
MANCHESTER—LONDON—ROTTERDAM—AMSTERDAM—HANOVER—BERLIN:
Daimler Airway, machines 12, passengers 10.
PARIS—LONDON:
Air Union, machines 11, passengers 8, freight 8,217 lbs.
LONDON—ROTTERDAM:
K.L.M., machines 6, passengers 7.
SPECIAL MACHINES: 0.

Total number of trips by British machines: 33, carrying 71 pas. Foreign machines: 17, carrying 15 passengers.

COMPARATIVE FIGURES:
For week ending Feb. 17:
Machines, 50; Passengers, 86; Crews, 78; Total personnel, 164.
Corresponding week, 1923:
Machines, 26; Passengers, 75; Crews, 49; Total personnel, 124.
Corresponding week, 1922:
Machines, 30; Passengers, 57; Crews, 47; Total personnel, 104.
Corresponding week, 1921:
Machines, 29; Passengers, 32; Crews, 35; Total personnel, 67.

Croydon Notes.

The event of the week at Croydon was the completion of 100,000 miles flying by one D.H.34 using the same Napier engine throughout. As is well known, several of the Daimler 34s have completed this mileage though in their cases the engines have been changed frequently. In the Instone Air Liner the "City of Washington," G-EBBV, the same Napier has been used throughout. It has been running day after day on the non-stop run to Cologne and when the engine has been overhauled the machine has been overhauled at the same time. This is a feather in the yachting cap of Mr. Baxter the chief engineer of the Instone Line.

On Monday of this week Mr. Woolley Dod met with a slight mishap when returning from Cologne (Köln) on G-EBBR. When near the aerodrome he ran into heavy rain and mist which obscured the hill around Kenley. He was unable to find Croydon and so he landed at Whyteleafe which is at the foot of the slope on the top of which is Kenley aerodrome. The machine landed in a sloping field and ran into a hedge and knocked down a tree 30 feet in height near the Caterham Valley branch of the Southern railway. The airscrew and the nose of the machine were smashed but the rest of the machine was undamaged. There were three German passengers in addition to the pilot but all escaped injury.

The accident to the Cooper monoplane on Thursday which involved the death of Lt.-Col. J. L. Travers is the first fatal accident which has occurred at the aerodrome since it became the Air Port of London. The machine took off over the A.D.C. buildings and made a wide, left-hand circuit. It fell in the south-west corner of the old military aerodrome near the trees. Much sympathy is felt for Major Cooper who was a very great friend of Lt.-Col. Travers.

Mr. "Sammy" Hall of Hall and Brenard Ltd. has been seriously ill with pneumonia recently. He has now made a good recovery and is back at the aerodrome.

Brooklands.

The A.N.E.C. monoplane has now been fitted with smaller wings and has been flying lately piloted by Messrs. James and Piercey. The top speed of the machine is round about 100 m.p.h. and she has now got rid of her habit of "hunting" when going at speed. The appearance of the machine has been greatly improved. One understands that there is some talk of sending the machine to France to participate in the forthcoming Tour de France des Avionettes.

The Berkshire Aviation Tours.

The Berkshire Aviation Tours are doing well in an extensive tour of Devon and Cornwall. They have recently visited Okehampton, Launceston, Liskeard, Bodmin and St. Austell. During January 1,700 passengers were carried and so far in February 650 have taken the air. Two Avros, G-EAKY and G-EBIW, are being flown by Messrs. Sparkes and Parkinson and the famous old G-EASF is also being prepared for use. G-EAKN is being prepared as a five-seater for the summer programme.

Mr. Fred Holmes is still in command ably assisted by Mrs. Holmes who may yet be the first qualified lady ground engineer.

French Air Route Statistics.

The report on the various air routes run by French companies in 1923 has been prepared by the Comité Française de Propaganda Aeronautique. It is stated that on the Paris-London route there were 1,023 journeys, in which 2,303 passengers were carried as well as 963,188 lbs. of goods and 1,627 lbs. of mails. On the Paris-Brussels route 537 journeys were made, 1,409 passengers being carried and 153,400 lbs. of goods. On the Paris-Strasbourg-Prague-Warsaw service and the Paris-Prague-Vienna-Constantinople service a total of 2,093 passengers had been carried through the various stages of these routes and 248,388 lbs. of goods and 6,947 lbs. of mails were carried. The Prague-Warsaw branch of this service was suspended during December and so was the Paris-Constantinople service. Over various stages of the Toulouse-Barcelona-Casablanca route 1,069 passengers were carried during the year as well as 124,600 lbs. of goods and 133,140 lbs. of mail.

The total distance covered by journeys in the whole of the French Air Services during the year was 2,106,000 miles and 7,811 passengers, 1,549,400 lbs. of goods and 161,800 lbs. of mails were carried.

The Institution of Aeronautical Engineers.

On Friday Feb. 22 Mr. W. O. Manning will read a paper before the Institution of Aeronautical Engineers on Low-Power Flying. The meeting will be held at the Engineers' Club, Coventry Street, at 6.30 p.m.

The paper will undoubtedly be found to contain a good deal of information concerning the light aeroplane, and it is hoped that as many of those interested in the subject as possible will be able to attend.

The Royal Aero Club Annual General Meeting.

The Annual General Meeting of the members of the Royal Aero Club of the United Kingdom will be held on Monday, Mar. 31, 1924, at 3, Clifford Street, London, W,1, at 5 p.m. Notices of motion for the Annual General Meeting must be received by the Secretary not less than 21 days before the meeting and must be signed by at least five members.

In accordance with the Rules the Committee shall consist of 18 members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election

The retiring Members of the Committee are:—Grp. Capt. F. W. Bowhill, C.M.G., D.S.O., R.A.F., Major-General Sir W. S. Brancker, K.C.B., Ernest C. Bucknall, G. B. Cockburn, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. M. O'Gorman, C.B., Air Commodore C. R. Samson, C.M G., D.S.O., R.A.F., Sir Mortimer Singer, K.B.E.

Any two members of the Club may nominate a member to serve on the Committee provided the consent of the member has been previously obtained. The name of the member thus nominated, with the name of his proposer and seconder, must be sent in writing to the Secretary not less than 14 days before the Annual General Meeting.

A Short Function.

Mr. Oswald Short was the principal guest at a dinner held by the foremen of Short Bros. Ltd. at the firm's works in Rochester on Friday Feb. 15. In response to the toast "The Firm" Mr. Short said that from a purely financial point of view the year had not been a brilliant one. They made quite a considerable loss but they kept employed from 1,200 to 1,700 men and women. The loss was made in the first half of the year when they were not very busy but they picked up again and were now very busy.

Ignoring the financial side of the question however, he looked upon last year as being the best they had had since the Armistice and hoped that it would be the turning point as now they had begun to see more clearly what was ahead of them and the signs were hopeful. Mr. Short spoke of the activities of the firm outside aviation and pointed out how successful they had been in building motor-bus bodies and also said that they were having another success in building railless electric cars.

In the Aircraft Department they had made most successful progress and though they were the first firm to set up an aircraft factory in the country this did not mean that their ideas were antiquated; rather the reverse was the case. They had recently made a speciality of the building of metal aircraft in spite of official opposition. He likened this opposition to the old controversy of steel and wooden ships. They had built one all-metal machine at a cost of £22,000 whereby their ideas on this subject were put into practice and owing to some men of vision at the Air Ministry orders had been placed for more. Opposition had melted as it must in the face of accomplished facts. In regard to the building of aircraft there was a motive which transcended to all profit making. They felt and he was sure that all other aircraft firms in the country felt that aircraft were in a way to become the first line of defence in the armaments of nations. He felt that they were serving their country by putting their factory in a position to produce machines in quantity.

He said that they all regretted to hear of the death of their old friend of the early days at Eastchurch, Lt.-Col. Travers. It was a great shock to read of his death because he had intended to visit them and they had hoped he would have been present that night. He was a man who saw far ahead with regard to aircraft development and his loss robbed the country of another early pioneer. He was sure they would all join in offering their deepest sympathy to his widow and relatives.

Back numbers of "The Aeroplane."

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THE AEROPLANE

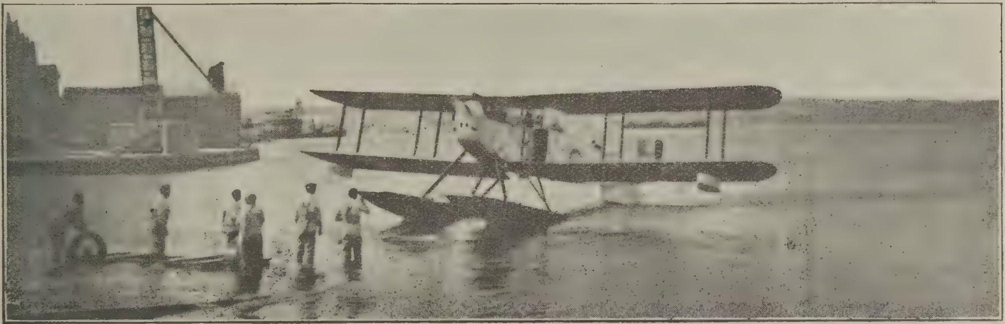
INCORPORATING AERONAUTICAL ENGINEERING

Edited by C.G.Grey

Vol. XXVI. No. 9. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper

MAR ... UNIVERSITY ...

A FLEET FAIREY.



AT THE MALTA SEAPLANE STATION:—A Fairey 3D (450 h.p. Napier Lion) coming ashore. On the left is seen the slipway and handling party armed with wheeled trolley on which the seaplane is brought ashore.

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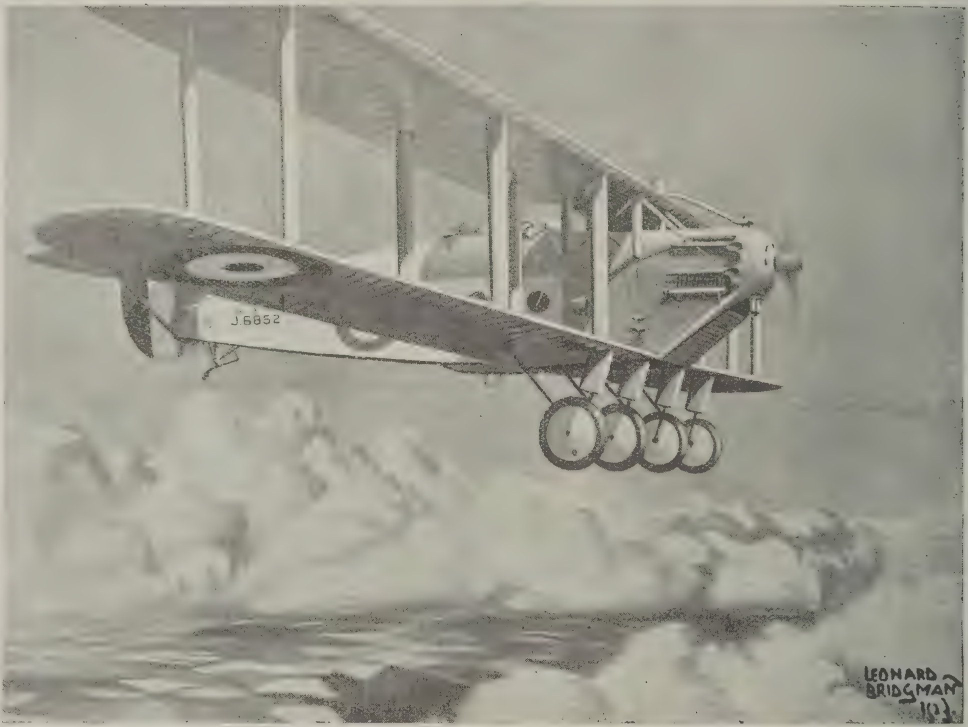

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1924.

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ON GETTING OUR DESERTS.

Quite the most delightful person who ever came out of the United States (or who ever stayed there) has a passion for what the play-actor folk call "good lines." One of the most useful and philosophical of such occurs in her pet story:—A newly arrived Swede was driving a mule team up a mountain in the Rockies somewhere near Seattle Wash. when the mules jibbed and began to back. In spite of his best efforts of tongue and whip they ended by backing the wagon over the edge of the road and naturally followed it themselves, tails first. The Swede jumped clear and as the team rolled in a tangled mass down the mountainside he shouted after them, "Well! I hopen you got you dam satisfy!"

Somehow the first official speech of our new Under-Secretary for Air, Mr. William Leach, delivered on Feb. 19, reminds one of that story. Judging by the daily news sheets Conservatives and Liberals and those of fancy political creeds are alike profoundly shocked and disturbed by Mr. Leach's perfervid pacifism. The degree of that pacifism may be judged from the report of Mr. Leach's speech which appears elsewhere in this issue. Apparently Mr. Leach is disposed to regard the aeroplane as a dove of peace rather than as an eagle of war. That is his point of view and as such it deserves respect. He may be wrong, but at any rate he is honest.

None can blame Mr. Leach for his views nor for expressing them in the House of Commons as a Minister of the Crown. The blame for the fact that such views should ever be expressed at all from the Government Bench rests on the assorted political parties which by squabbling among themselves have allowed a professedly pacifist Government to come into power. It was they and not the majority of the English people who caused the election of Mr. Leach and his colleagues, and so one can say to them as the Swede said to his mules, "I hopen you got you dam satisfy." In other words, we have received our deserts.

Personally one rather likes individual pacifists as such. But one mistrusts and fears them in bulk as a political power because of the facility with which they produce war and the ruthlessness with which they wage war when they have once begun. Their attitude is that of the Quaker whose adherence to the doctrine of turning the other cheek to the smiter was tested by an unbeliever. The aggressor smote the Quaker on one cheek and asked jeeringly whether he would follow the Bible precept. The Quaker meekly turned the other cheek and was duly smitten. Whereupon he knocked the aggressor down and jumped on him remarking only, "The Scripture enjoineth not what shall follow thereafter."

History is full of wars which have been produced and prosecuted to a bloody end by pacifists. Among recent examples one need only mention the American Civil War produced by the pacifist Abraham Lincoln, the continual wars in which we were involved by Mr. Gladstone's Cabinets and the Russian Revolution begun by the pacific Kerensky, the result of which last effort may well have to be met by Mr. Leach and his colleagues.

It is arguable that the pacifist does in the end make a better job of a war than does a militarist. The professional fighting man is a little apt to regard war as an end in itself. The pacifist regards war as a means to an end—but he has to be hurt rather badly before he adopts the means to end his being hurt. Cromwell's Roundheads and Lincoln's Federals made a fairly clean finish to their wars, but the preliminary expenses seem to have been unduly high.

Nevertheless, while one has no doubts about the ultimate result of any war into which we may be launched by our pacifist Government one cannot agree with Mr. Leach that international politics can be conducted on the lines of the Sermon on the Mount. He may be right in a way in saying, "All the nations in the world that prepared most got the most war," but in another way he is wrong.

Germany was the best prepared and Germany was never invaded at all, except for a minute corner of Alsace and a small piece of East Prussia. Great Britain was well prepared and only felt a few bombs and naval shells. France was less prepared—because so badly organised—and the result is the still-devastated area. Russia's preparation was chaotic and Russia has been reduced to complete chaos. Servia and Rumania and Belgium were not prepared at all and they were over-run completely. Austro-Hungary was well prepared in spite of inherent weaknesses, and Austro-Hungarian territory was preserved almost intact until the Central Powers were overwhelmed by the sheer weight of the numbers of the twenty-two (or thereabouts) Allied Nations. So on the whole the argument from the point of view of home defence seems to be in favour of preparation for war.

Mr. Leach remarked;

> "I want to see some new excavation works to raise the lid of the Sarcophagus of the New Testament. Perhaps the Churches may oblige in this matter, and not leave it wholly to the statesmen of a Labour Government. I believe a new Gospel is needed. I suggest that if you want peace you must prepare for peace. This Government is preparing for peace."

Against that one may say to Mr. Leach and his fellow Apostles that the complement to the doctrine "In time of peace prepare for war" is "In time of war prepare for peace." It is just as expensive *preparing* for peace four years after a war is over as it is preparing for war after war has begun. We should have *prepared* for peace during the period between the Armistice in 1918 and the official end of the War in 1920: instead of which we all indulged in an orgy of strikes and extravagance.

One does not believe that the Churches can help much, for they need reforming quite as much as does the body politic. With them it is a case of "Physician heal thyself." And in any case the Christian Churches are in such a minute minority compared with the pagan population of Western Europe and the Mahometan and other populations East of Warsaw that they can have little influence on World Politics.

Moreover, if a great religious revival swept over Europe and caused complete brotherhood and complete disarmament among European nations the result would merely be that Europe would be left absolutely open to the first Tartar horde that took it into its head to indulge in a Westward promenade with swords in its fists. It seems hardly likely that the assembled ecclesiastics of the Christian Churches would form an effective first line of defence against such company. Our only protection against such visitors is the arming of civilised Europe with modern weapons such as aircraft and tanks so that our inferior numbers may be able to defeat superior numbers which are less well armed.

And if one European nation be armed then all the others must be armed against it. Either there must be complete disarmament or complete armament. Anything half way is only an expensive form of national suicide. If we persist in refusing to protect ourselves then "I hopen we get our dam satisfy."—C. G. G.

THE UNITED STATES AND AIR RACING.

According to that excellent United States journal *Aviation*, the rumours that the Naval Bureau of Aeronautics will not participate in either the Pulitzer Trophy, the Curtiss Trophy or Schneider Trophy races are well founded. Though no official announcement has yet been made *Aviation* learns from an authoritative source that these rumours are substantially true and it seems that the U.S. Army will follow suit.

The reason for this step is that the Air Service Appropriations this year are so small and in previous years so much money has been expended on races that there are practically no useful service machines possessed by the Army or Navy.

Everyone will welcome this decision as it now places the United States on more level terms with other countries in air racing. Although there is no harm in any Government assisting firms in a financial way, it is against all the best principles to pay the whole cost of experiment and building of racers and to finance an expedition accompanied by pieces of the Navy to race against private firms.

If Italy or France succeed in bringing the Schneider Cup back to Europe then everyone will hope to meet the private firms from the United States in friendly rivalry next year.

At the same time it is only fair to acknowledge the fact that thanks to the competition of the U.S. Army and Navy machines the World's speed records have been placed at figures which will excite the ingenuity of European designers if they are to be beaten.

THE AIR DEBATE.

On Feb. 19 the question of aircraft was first raised in the House of Commons under the new Labour Government, the intention evidently being to draw a statement as to the Government's future intention in relation to air defence. The debate was opened by our previous Secretary of State for Air, **Lieut.-Col. Sir Samuel Hoare**, who moved:

> "That this House whilst earnestly desiring the further limitation of armaments so far as is consistent with the safety and integrity of the Empire, affirms the principle laid down by the late Government and accepted by the Imperial Conference that Great Britain must maintain a Home Defence Air Force of sufficient strength to give adequate protection against air attack by the strongest air force within striking distance of her shores."

Sir Samuel began by disclaiming any suggestion disguised or undisguised of hostility towards France and said that he did not suggest any breach of friendly relations between the two countries any more than a breach between ourselves and the United States of America was likely in comparing the strength of the British Navy with the strength of the Navy of the United States. He said that he was just as anxious as any other member to see a limitation of armaments and was just as apprehensive in seeing the possibility of a new race in armaments starting.

He agreed with the Prime Minister (Mr. Ramsay MacDonald) that an international conference must come at the end and not at the beginning of negotiations. The history of post-war Europe had been a history of failure after failure at international conferences because agreement had not been reached before the conferences sat. The risk of a treaty of mutual guarantee was that they might be increasing and not diminishing their demands. Members on his side of the House were anxious to see a limitation of armaments, provided that the limitation could be general and provided also that it was consistent with the safety and integrity of the British Empire.

A week ago the Prime Minister had said:

> "For some time to come the bargaining power of a British Foreign Secretary is not to depend upon military force but upon the reasonableness of the policy which he presents"

Sir Samuel did not claim that diplomacy was always successful in proportion to the force behind it, but he thought that the Prime Minister would find in negotiation that it was not a disadvantage to have a supreme Navy behind him and that it was not an advantage to have behind him an Air Force which while excellent in quality was altogether insignificant in quantity.

On the strength of his recent position as Secretary of State for Air he said that we have now about 80 first line aeroplanes definitely allocated to home defence. At the present moment there were in France about 1,000 first line aeroplanes. Of these about 600 were what was known as the French Independent Striking Force, the other 400 being allocated to duties with the French Army. Taking them together the French had aboat 1,000 first line machines against a little more than 100 in this country.

During the War the greatest amount of bombs ever dropped in England in a single month was 12 tons. To-day 800 machines could drop 170 tons of bombs on London in the course of 24 hours and could keep up a bomb attack of 57 tons per day for an indefinite period. Capt. René Fonck, the distinguished French pilot, now a member of the Chamber of Deputies, had said that 500 aeroplanes could in a single night obliterate a city one kilometre square and that such a force could wipe off the earth a city as big as Paris in the course of a fortnight.

The previous Government had adopted the principle embodied in his resolution, namely however improbable war might be an air force must be built up sufficient to defend these shores from any possible air attack. The first stage was to be an increase of the Air Force for the purposes of home defence which would bring it up to a strength of 600 first line machines. That was a strength of 52 squadrons devoted primarily to home defence. The first question he wanted to ask the Government was whether they were going on with this expansion or not. Were they going to set up new aerodromes and to continue his programme of enlisting a larger number of boys and of ordering new machines? He inquired as to their policy regarding the engagement of non-regular personnel as mechanics for home defence squadrons.

As to Civil Aviation he said that certain people took the view that civil aviation could be a substitute for military aviation. His belief was that such a time was still far distant and that the most we could hope for in the near future was that civil aviation if properly developed might be supplementary to and very valuable to military aviation. He said that dependence upon subsidies was most objectionable and that he hoped civil aviation would stand upon its own feet and would develop like any other economic enterprise.

As regards airships Sir Samuel said that we should think it most regrettable if after these months of investigation and years of negotiation the scheme upon which they were mutually agreed should be held up and that there should be another long period during which no airship development took place.

Mr. Leach, the Under-Secretary for Air, making his first speech in that capacity, said:—

I have listened with a great deal of interest to the speech of the right hon. Member for Chelsea (Sir Samuel Hoare). It must be clear to the House that he is a master of his subject, and that he speaks with a sense of very deep conviction. I must admit that he has put his case with very much temperance of speech, and I shall seek to meet, so far as I am able, his request for information from the Government. He has drawn a very alarming picture of the disparity of the Force between ourselves and France. Whether that be so or not, the responsibility does not lie with us. It is our legacy and not our responsibility, but for the moment I must decline to be alarmed about it.

I was glad to hear the right hon. Gentleman tell us of his earnest desire for a further limitation of armaments, consistent, as he puts it, with the safety and integrity of the Empire. Everybody wants a decrease of armaments, perhaps even the armament makers. I came into this House one night recently, and I heard a Member on the opposite benches saying that what he wanted was a clean bill of health without slaughter. It struck me that I had stumbled into the Debate that was down for to-night. Everybody in the world wants less armaments.

The one thing that was knocked on the head during the War was the doctrine that in order to get peace we must be prepared for war. All the nations in the world that prepared most got the most war. Preparedness is not the best weapon in diplomacy. The best weapon in diplomacy is to have a sound and righteous cause. I always think that preparedness indicates a fear of one's neighbours, a disbelief in the righteousness of the intentions of those neighbours. Well, I am not a disbeliever in the righteousness of France's intentions.

I am reminded by this Resolution, which is divided into two parts, of an ancient military slogan: "Trust in God, but keep your powder dry." It was a cynical motto. Perhaps there may be something to be gained out of this Debate to-night if we can learn which to rely on ourselves most. Moreover, over 2,000 years ago, a great reformer, laid down the principles for solving this problem of national defence. Most unfortunately, nobody accepted His views on the matter They were buried with Him. I want to see some new excavation works to raise the lid of the Sarcophagus of the New Testament. Perhaps the Churches may yet oblige in this matter, and not leave it wholly to the statesmen of a Labour Government. I believe a new Gospel is needed. I suggest that if you want peace, you must prepare for peace. This Government is preparing for peace. We can already see a break in the clouds.

The right hon. and gallant Gentleman wants me to define the attitude of the Government towards national defence. He asks in plain, explicit terms are we going on with the expansion scheme? I am going to tell him in plain and explicit terms that there is no change in the policy of the Government for the time being.

Let us examine what those expansion proposals are. First, there was the increase for home defence authorised by the Coalition Government in August, 1922. It was then decided to form 15 new squadrons, to be completed approximately, by April, 1925. At that time we had only three squadrons allotted for home defence. The total by April, 1925, will thus be 18 squadrons. This decision was re-affirmed by Mr. Bonar Law's Government.

A further increase of 34 squadrons was approved by the late Government in the way that the late Secretary of State for Air indicated. This announcement was made to the House on June 26 last year. I am sure that the right hon. Gentleman does not want me to go more closely into the details of the expansion scheme than that, and I think the House will agree that wisdom lies in the barest of statements on these proposals at this juncture. That plan for the time being will not be interfered with. Continuity has been agreed to by the Government. This Government has taken over the responsibilities left to it by its predecessors.

The scheme itself is being worked out in definite stages, and it will not, and does not, debar us from taking full advantage of any new movement in the direction of disarmament or in the reduction of armaments. We should welcome a new Washington Conference. We shall do what in us lies to make such a Conference possible. As the House knows, the Treaty of Mutual Guarantees proposed by the Temporary Mixed Commission of the League of Nations is already in draft. It is now being considered by the various Governments If that Treaty be approved, reductions will presumably be practicable. I think His Majesty's Government can be trusted not to be slow or backward in all efforts towards such an agreement My predecessor, the right hon. Gentleman who has moved this Resolution to-night, has pointed out the difficulties which stand in the way of quick increase of air squadrons. Let us not forget them. You have, for instance, to remember that there is the provision of stations for the accommodation of these squadrons. There has to be the acquisition of land, and the erection of buildings. There has to be the enlistment and training of men. There has to be the increase in the numbers of boy mechanics, and facilities for their training. All this, as the right hon. Gentleman pointed out, takes time. The scheme is going forward, and any deviation from it, if contemplated by this Government, will be brought before this House, and will have to be sanctioned here.

The Auxiliary Air Force and the Air Force Reserve Bill is on the list of essential Bills to be submitted to this House. As the right hon. Gentleman knows, it will require legislation in order to establish those forces.

He then asks me, what steps are being taken in regard to ordering machines of a new type to meet the requirements of this new force? I have to say that the whole scheme is growing up in regular and definite stages, and sufficient machines are being ordered to equip those squadrons that will come into being during the coming year. It must be borne in mind that during the formation of the squadrons

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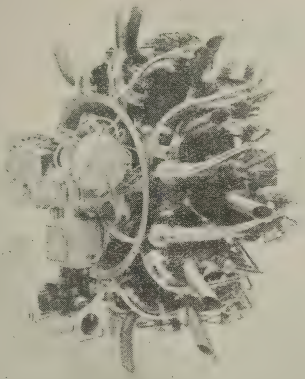

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> and pending the delivery of the new machines, some of the squadrons will, for the time being, have only training machines and present types of service machines. Time will remedy that
>
> Then the right hon. Gentleman asks me in regard to civil aviation, what are we doing with reference to the proposals that went through the House while he was Minister for Air, bringing four companies into one Imperial Transport Company. That agreement, as he says, has been signed. It is a *fait accompli.* This legacy, also, so far as the present Government can do so, will be properly fulfilled. We are anxious to foster civil aviation. We shall take whatever measures that are open to us to do so
>
> In regard to airships, I can add no more to the Prime Minister's answer on the subject of that scheme which is associated with the hon. and gallant Member for Uxbridge (Lieut.-Commdr. Burney). We are vitally interested in seeing that the lighter-than-air ships shall be explored, encouraged and fostered in every proper way that is open to us.
>
> Capt. W. Benn: Will they be kept under the Ministry of the right hon. gentlemen and not handed over to the Admiralty?
>
> Mr. Leach: That is another of those problems about which a decision has not been reached. A solution may possibly be discovered. The Admiralty are fine stubborn people with whom it is good to argue. The Noble Lord the Minister for Air is having great joy in his discussion with them
>
> The second part of this Resolution calls for a home defence Air Force sufficiently strong to provide an adequate protection against the strongest air force that is likely to be within striking distance of our shores. I suppose that on that as a pious declaration little criticism can be made; but I have wondered whether it is a practical proposition. I have wondered what the right hon. and gallant Gentleman envisaged, supposing you have the unhappy event of war. Say our signallers warn us of the approach, say, of 100 fighting aeroplanes upon London. Are we to have 100 to go up to meet them? Hon. Members: "Two hundred!") Two hundred ready! (Hon. Members: "Five hundred!") Is each man, each airman, to single out the individual that he proposes to attack, and set the thing going in that way? What is adequate protection? Suppose there is an attack on Portsmouth, or Harwich, or Plymouth. Are aeroplanes to be stationed in the expectation that all these places are likely to be attacked?
>
> Can aeroplanes give adequate protection against aeroplanes? Everybody knows they cannot. If we had 50 machines to one against the strongest air force within striking distance, we would not be adequately protected, in the opinion of some people, and if we were ringed round from the Humber to the Thames, and around the South Coast to Cornwall, with machines every hundred yards, there would be somebody still saying that this was not adequate protection. Totally adequate protection is like the totally honest man—it has never been discovered.
>
> The air force is an attacking weapon, not a weapon of defence. The right hon. and gallant Gentleman disavows any intention of embarking on another armaments race, but this Resolution almost seems as if there was a desire for another armaments race. It asks, or seems to ask, for a new one-Power standard Air Force. When you have got that, some lunatic will demand a two-Power standard. Then the hysterical Press will back him up and probably demand a three-Power standard.
>
> I am not a great military strategist or an expert. I can see that an army can keep another army off, and that a navy can prevent another navy landing men, and also that an air force, so far, cannot prevent an air raid. It is not pleasant to contemplate it, but up to date—and the Resolution ignores it—the only adequate defence that I can see is a changed international atmosphere. If we continue to put fear at the helm and folly at the prow we shall steer straight for the next war.

Major-General J. E. B. Seely said that the astounding doctrine given at the close of Mr. Leach's speech would if followed to its logical conclusion mean the disbanding of our Army and of our Navy and our Air Force. This country had not been and was not now an aggressive country. We had throughout endeavoured to pursue a peaceful policy. He was sure that if the Government accepted Sir Samuel Hoare's motion nobody would be more delighted than the French nation.

The new Force advocated could drop at least 300 times as much bombs as was dropped by the enemy in Sept., 1917, when people fled into the tubes and all work stopped for days. It could be said with certainty that not less than 100 casualties would follow every ton of bombs dropped. That would mean 12,600 casualties in the first raid and between 8,000 and 9,000 daily thereafter. The whole of London would be on fire and trains would cease to run. There was no other answer to an aeroplane except another aeroplane.

Mr. Ben Turner said that there was an answer—The New Testament.

General Seely continuing, said that we should not get the Powers of the World to agree to limitation of air armaments unless we could say as we have said in the case of the Navy that we had nothing to fear. He made this appeal in the interests of Imperial safety. The British Empire could not survive if this country were destroyed. He appealed to the Secretary of State for the Colonies to see whether the Dominions and India could not co-operate with us in this question of adequate air defence. Then as a united empire fearing nothing we could appeal to the World to abate armament.

Mr. Wallhead said that the only possible nation from which could come the dire effects to which General Seely had alluded was the nation to which he had referred as "our dear friends" (France). No danger could be apprehended from Germany if the Allies maintained the Treaty of Versailles in its entirety. No danger could be apprehended from the Scandinavian countries or from Switzerland, Belgium or Holland. From what the last speaker had said it was obvious that we were hopelessly inferior to France and if we started on a race for aerial supremacy France would complete the race almost before we began. If this country were to begin by making the courageous attempt to bring about a stoppage of this infernal race that would lead up to the establishment of some power that would take the place of armament and war our country would go down to posterity as one of the greatest countries that ever existed.

Captain Eden, in a brief but very sound maiden speech, said that surely the point was that we should prepare to defend ourselves against an attack from any quarter. It was not in the nature of things possible to provide at a moment's notice for air defence and the heart of our country, the City of London, was especially vulnerable to air attack. Mr. Leach had said that he believed preparedness was not a good weapon. Unpreparedness was a very much worse weapon. Attack was the best possible form of defence. Further Captain Eden said:—

> It is a natural temptation to hon. Members opposite, some of whose views on defence were fairly well known during the years of the War, to adopt the attitude of that very useful animal the terrier and roll on their backs and wave their paws in the air with a pathetic expression. But that is not the line on which we can hope to insure this country against attack from the air

Captain Wedgwood Benn referring to aerial warfare said everyone knew how horrid it was in the last war and how infinitely more horrid it might become in the next war, but there was no real way of preventing them. Our present programme was no answer to the French programme. Our increase of 39 squadrons was not a race in armament, it was merely a stimulus to us. If the Government accepted the theory that there was a limited pool of money for national defence and if it appeared that modern warfare was better conducted by air than it was by sea or land, were they prepared that any necessary increase in air expenditure was not to be met by increased taxation but by economies in the other departments? Secondly he asked were the Government using the existing Air Force to the best advantage? Was it the intention to bring the Air Force home from Iraq at the earliest possible moment?

He thought that American assent to naval reduction at the Washington Conference was not due to our undefeated Navy which the Americans knew quite well they could beat in the course of time, but that it was due to the noble impulse of the President of the United States. He thought that Civil Aviation was capable of becoming one of the greatest agencies for peace in the World. He earnestly hoped that the last war did something to bring war to an end It would be a disgraceful betrayal of men who laid down their lives unless the Government took practical steps in the direction of bringing about disarmament.

Lieut.-Commander Burney said that we should look upon an Air Force exactly as upon paying a fire insurance premium, and until the Labour Party would admit the ordinary common sense of the premise he did not think they would go very far in a debate of this character. He reminded the House that the Navy used to be the cheapest form of fighting force because we had not the burden of a Continental Army to maintain and were able with a cheap Army and a relatively cheap Navy to build up our Empire at a comparatively small cost. Continuing he said:—

> Now science has brought in a new element, and we have to bear the Continental burden and the Imperial burden, and unless we can relieve ourselves of half that burden, we shall put upon this country such an economic strain that we shall not be able to afford it. As far as the Continental burden is concerned, we shall have to support that until such time as hon. Members opposite are successful in developing their disarmament policy I, for one, heartily hope that they will be speedily successful, but, pending that time, we have got to support the double burden of a Continental system which will now be transferred entirely to the air, as well as our Imperial burden. It seems to me that the most urgent problem we have before us to-day is the development of our Empire, because we have got to make the Dominions do their share of the economic upkeep of our defence forces. They do not do it to-day in any respect in comparison with the taxation upon this country.
>
> Therefore I would direct the attention of the Under-Secretary for Air to the absolute importance of speeding up our Air communications, which will be one of the vital factors towards binding our Empire together in such a manner that we can make political control coincide with economic dependence

The Secretary of State for the Colonies, Mr. J. H. Thomas, said that while we must endeavour to be practical we must at the same time keep clearly at the back of our minds that the object of all people and all parties must be in the direction of peace and disarmament. The Government were not going to ask the House to accept the motion and he would give reasons which would satisfy the mover. He wished to pay public tribute to Sir Samuel Hoare for his work in connection with the Imperial Conference but Sir

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Samuel Hoare knew perfectly well that if there had been no change in the Government the latter part of his Resolution would not be fulfilled.

SIR SAMUEL HOARE dissented, saying that this increase was to be the first stage and then if necessary we should have gone on.

MR. THOMAS continuing said that it was the present Government's intention to give effect to the first stage of the development. But supposing Sir Samuel Hoare was still Minister for Air, in four years' time, assuming that France did not build one solitary additional aeroplane, we should then be in a position of only something like four-fifths of the French striking strength when all his money had been spent. We should not deceive ourselves. It was not money or aeroplanes that was going to save us. We had to face the cold hard fact that the only adequate protection was that nations realised their obligations and that their duties lay in the direction of peace. Setting forth the Government's policy, Mr. Thomas said :—

> First, we say clearly and definitely that there is not only no break in the first continuity of your policy. That is to say, the first stage is going on and there has been no break whatsoever. The two Bills are being introduced and pressed at an early stage, and their importance is fully recognised. But the Government want to survey the whole question, because this is not alone a question of the air. The Army and Navy are involved in it, and the Government not only want to survey the question as a whole, but they want to be free to bring about disarmament if they can.
>
> My hon. Friend asks how they are going to do it, but no one can say yet. The most we can say is that there will be no disarmament until confidence is established, and our first effort and our first aim ought to be, and will be, to establish confidence. He asked me what is the position of the eight squadrons in Iraq. I do not think that arises on this Motion. To deal with that aspect of the question a number of factors must be considered and obviously it does not come within the category of home defence. I am not going to be baited into bringing in this very difficult problem of Iraq in connection with home defence.
>
> The Air Estimates will be put down at any date when the Opposition feel that they would like them discussed, and a full, definite statement on the whole policy will be given. But the Government ask the House not only to realise their difficulty, but to realise that their clear, definite policy is to have a free hand, and whilst recognising defence, whilst realising the Colonial aspect of the question, whilst giving an assurance of a continuity of the first stages of this programme, to reserve to themselves the absolute right to do nothing or to be committed to nothing which would prevent them working for disarmament in future.

REAR-ADMIRAL SUETER expressed surprise at Mr. Leach's speech. He asked whether any Member could tell what was likely to happen within the next twenty years in Europe. If we had carried out before the War the policy of the Under-Secretary for Air we should have lost the War. Before the War we had great difficulty in building up an Air Service, and at the end of the War we had the finest Air Service in the World. He would like to ask the Secretary of State for Air and the ex-Secretaries belonging to previous Governments what they had done with that Air Service?

In this financial year £122,000,000 were to be devoted to defence. We certainly had no defence from the air point of view. Out of the total the Air Service only got £12,000,000 and the air ought to get 33⅓ per cent.

He had heard that the Burney airship scheme was to be scrapped. He wanted to warn the Government against risking men's lives in old airships as the French had done in the Dixmude.

Also he said we had far too many accidents with aeroplanes. During the early days of the Air Service there were fewer accidents in the Naval Wing than in the Military Wing and he attributed that to the skill of the mechanics. Whenever he read of an aeroplane accident he thought that it was probably the fault of the mechanics.

LIEUT.-COMMANDER KENWORTHY asked how it was expected to defend great cities by aeroplanes against aeroplane attack at night. It was extremely difficult for destroyers to find other destroyers at night working in two dimensions so it was only by a fluke that aeroplanes working in three dimensions could find one another.

The only sound strategy of defence was to attack the other people. If we built up a force sufficiently strong to threaten the nerve centres of possible enemies then we would get people in the French Chamber or the Belgian Chamber starting debates like that in the House that night and pointing to our Air Force and again piling up armaments.

He said that there were at present three Staff Colleges where the young idea and the middle-aged idea were taught the strategy and tactics of their various arms. There were friendly visits of the staffs and they played war games in which each staff took part. Two favourite war games were studied to-day, one in connection with the defence of Singapore and the second was air war against the strongest air Power, which was France.

Right through the debate that night there had been the motive that we must arm against France. France in her turn would take a note of the new air arms. Our preparations would be used by the scaremongers and by newspapers in France supported by the private armament makers in France as a reason for obtaining still further French air armaments. The only remedy was public opinion.

If that night's speeches, especially those of Sir Samuel Hoare and General Seely, were broadcast and explained to and understood by masses of the people in this country and in France, Spain, Belgium, Germany and Russia, we should after a few lectures of that sort educate public opinion to such an extent that a remedy would be demanded and the only remedy would be all-round disarmament and an international police force.

He suggested a conference of European Powers and advocated the United States of Europe in aerial matters. It might come before another great war with Bolshevism or it might come afterwards. If the peoples of Europe were to experience the horrors of modern scientific aerial warfare they would rise in sheer desperation and overthrow the existing system of society. Then we should get internationalism after a catastrophe which would probably mean the end of civilisation as we knew it. The alternative was to be sensible and to educate public opinion.

While we were compelled to have an Air Force let us have an efficient Air Force. Let us consider how necessary it is that we should get on good terms with the greatest country in Europe, Russia, and Russia could become the greatest air Power in Europe. If we had to go to war she could be an extremely valuable ally. If war were inevitable then we should have to look for a fresh balance of power and that balance of power lay on the line London-Berlin-Moscow.

LIEUT.-COLONEL MOORE-BRABAZON said that the question of the air had never been really appreciated by the public.

On the subject of aggression he said that the only aggressive speeches that he had heard in this House were delivered by Members of the Party opposite (the present Government) on the question of the Ruhr against France. As to disarmament he said that at the end of the War we had an Air Force transcending any Air Force in the World and within eighteen months it had shrunk to be almost insignificant. Surely that was a great moral gesture which brought about a proportion of power of twelve to one against us. On that basis it seemed that moral gestures were not a very efficient way of getting disarmament.

All the aspirations of the present Government with regard to better conditions for the people of this country would be wasted if this country should be defeated. Surely therefore it was the duty of a Government which professed interest in the social advancement of the country to ensure that it was secure. There were only two ways of limiting armaments, one was to stop Powers abroad building against us and the other was to build against them. He did not say that the Government had anything but the very best intentions but they should remember that the silliest mistakes in history were made with the very best intentions.

It seemed to him that many honourable Members opposite appear to live in a world where there are not hats but halos. Some of the halos seemed to have slipped down and they seemed to be looking at the World through a fog. He saw with pleasure opposite to him a row of Parsifals. He would like to remind this row of Parsifals that though we in this country may be of a moral integrity better than any other country in the World outside this country we have to compete with men and not with angels. What he wanted was to get the Government to accept the principle that Great Britain must maintain a home defence Air Force sufficient to give adequate protection.

MR. THURTLE lamented the lack of firmness of principle of the Government in regard to disarmament and imagined there must be a number of uneasy consciences on the Treasury Bench seeing that so many Labour Members were definitely and firmly pledged to the principle of disarmament. He said that he wanted to put a new point of view to the House. The whole idea of this air defence force was to get into the minds of the people of this country the thought that they were to a certain extent secure from air attacks. He submitted that this was undesirable because there could not be a real guarantee in any case and a false sense of security has very serious disadvantages. If the people of this country could get into their minds what the results of war in the future would be and that not only the fighting forces would be involved but practically the whole of the population of the country he believed that they would think very hard and very long before they decided upon war.

CAPTAIN GUEST said that the debate was unsatisfactory. The late Secretary of State for Air, Sir Samuel Hoare, had not made the best of his case and the present Under-Secretary for Air had replied in terms which left us in grave doubt as to what the Government was to do. He agreed that the proper time for going into these matters was in the Debate on the Air Estimates.

It being then after eleven of the clock the Debate stood adjourned.

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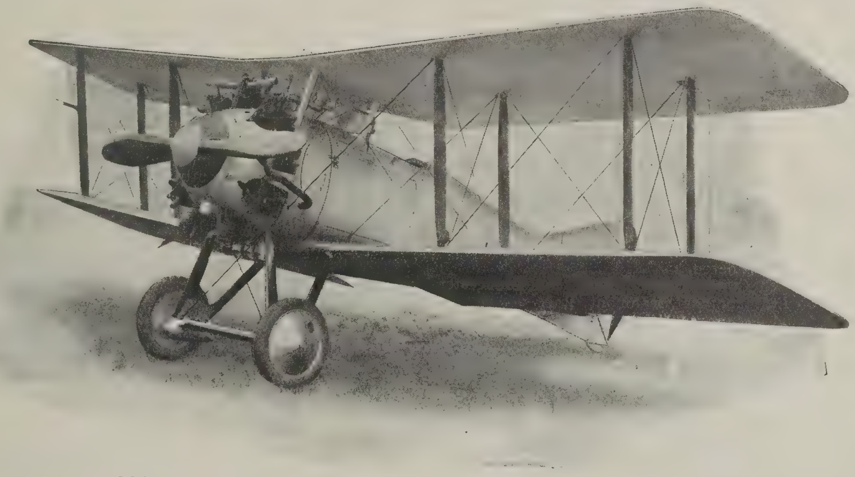

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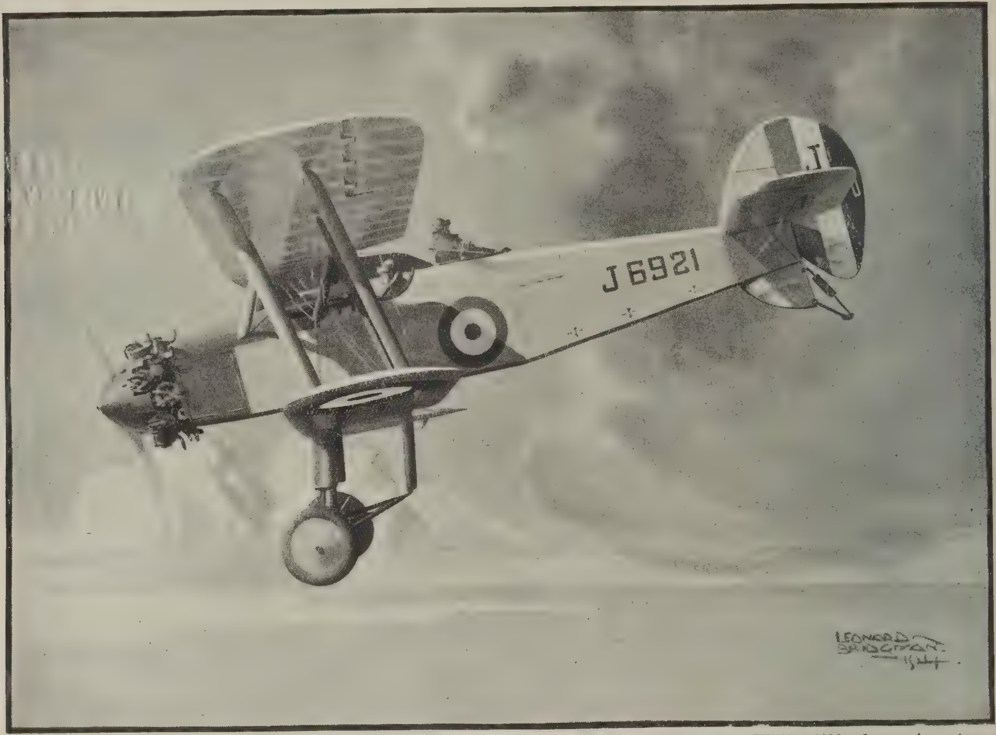

THE WOLF.—An impression by Mr. Leonard Bridgman of the Armstrong-Whitworth Wolf (400 h.p. Armstrong-Siddeley Jaguar). The machine is one of the latest two-seater fighters.

Royal Aero Club Events, 1924.

At a meeting of the Committee of the Royal Aero Club on Feb. 20 the following matters which had been sent forward by the Racing Committee were discussed :—

The Two-Seater Light Aeroplane Competition 1924 :—The Regulations for the Prize of £3,000 offered by the Air Council were finally approved.

The King's Cup Race 1924 :—The proposal that this year's race be confined to seaplanes was approved.

The Aerial Derby :—The proposal to limit the landing speed and the further proposal that the race should be held away from London and preferably near a large town in the South, giving facilities for a clear course in the open country, were considered.

The Beaumont Cup :—The entry of the Gloucestershire Aircraft Co. Ltd. for the Beaumont Race to be held in France in June next was confirmed.

Belfast as an Air Terminal.

It has now been decided that the Belfast-Manchester air service will be established in the second week in April. The result of the experiments last year proved conclusively the possibility of such a service and its great utility to the business community. The moving spirits in this new service are Messrs. D. M. Greig and E. Higgs (both well-known figures in lawn tennis circles), in conjunction with the de Havilland Aircraft Company, Ltd. An experimental service will be run at first for six months and there will be one machine daily in each direction. Three D.H. 50a's. will be used.

The Belfast Chamber of Commerce passed the following very important resolution :—

> That on the establishment of the Aerial Service between Belfast and Manchester the Ministry of Commerce be requested to take the necessary steps to ensure that first class mail matter, at present sent via Larne and Stranraer, be despatched by Air and re-forwarded from Manchester. Further that the Air Service be utilised in connection with the outgoing American mails from Southampton, thereby enabling letters to be posted one day later. The Executive Council of the Association of Northern Ireland Chambers of Commerce believe that this Service could be provided at a surcharge of ½d. per letter, and would urge that the Ministry of Commerce endeavour to make arrangements with the General Post Office Authorities to that end. The Association is of opinion that this action will
>
> (a) accelerate the delivery of the mails, and
>
> (b) enable the possibilities of improving communication by means of aircraft to be fully explored.

By this means mails from America and to America will save one whole day, which is very important from the Belfast Linen Industry's point of view, as they are in rivalry with Lille, which town at the present moment receives its American mail one day in advance of Belfast.

A guaranteed load in each direction between Belfast and Manchester has already been secured. Mr. Greig is of opinion that the air service could be made to pay by carrying mails for the Post Office without any additional surcharge whatever. The service will be entirely without subsidy and for that reason alone it will be worth the attention of every business man who has any trade connections with Belfast.

Both Glasgow and Londonderry also desire aerial communications with Belfast and it seems quite probable that Belfast may become the North Irish Terminal Aerodrome and be as important to North Ireland as is Croydon to England.

The Belfast Corporation on Friday, Feb. 22 approved the acquisition at a cost of £14,000 of 54 acres of land at Malone, just outside the city, as the terminal aerodrome for the proposed mail service to Manchester. The Lord Mayor announced that the Air Ministry had approved of the site provided the surface was levelled. It was pointed out that this was no speculation because even if the air service was discontinued the Council would still have available land for the development of building.

This is a point of view that might well be brought to the notice of other big towns such as Manchester where the fate of the Alexandra Park Aerodrome of which the lease expires on Aug. 1 is at present uncertain. If the ground is not secured Manchester which now holds a prominent place on the air routes will find itself without aerodrome facilities.

De Havilland Progress.

Owing to the shortness of the day and the unfavourable weather that has prevailed of late the de Havilland Aeroplane Hire Service has not done much since the beginning of 1924. Nevertheless much is being done at Stag Lane and the firm looks forward to this year as one likely to be highly successful.

The D.H.50 (240 h.p. Siddeley Puma) which made its appearance last year has been modified, and as the D.H.50a it will be the standard equipment of the D.H. Hire Service. The modifications include a lengthening of the cabin by six inches which allows more leg room and also the inclusion of more baggage space, and various other slight constructional alterations which have been indicated by tests on the original type.

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S.B.A.C.

Vickers "Vanguard"
23 Seater Aeroplane
fitted with Two 450 h.p. Napier "Lion" Engines.

Vickers "Viking" Amphibians.

Seven D.H.50as are at present being constructed, which are for use on the Hire Service, the Manchester-Belfast service and on the Malmö-Hamburg service which is to be operated by the Florman Air Service in conjunction with the Swedish Post Office.

In addition the Queensland and Northern Territory Air Services having operated D.H.9cs with great success on their Charleville-Cloncurry service are replacing these machines with D.H.50as, and the type is also being built under license by the S.A.B.C.A. in Brussels for use in the Belgian Congo.

An experimental set of floats is now under test for the 50a, which should make the machine highly suitable for river work in the Colonies.

At the moment tests are being carried out at Stag Lane with a D.H.50a which is fitted with wing flaps the operation of which is quite automatic, the automaticity being the subject of a D.H. patent. In tests carried out the machine has shown a minimum speed of 45 m.p.h. and a landing speed of 40 m.p.h. under perfect control.

As regards the Hire Service it is interesting to note that during 1923 the 500,000 unsubsidised mile figure was reached. With the D.H.50a as the standard machine for the coming year it is confidently expected that with its performance and increased useful load a substantial addition will be made to this highly creditable total. All charges for the coming season are to be based on rates of either 2s. per mile or £8 per hour.

As regards the de Havilland Aircraft Co. Ltd., the works seem to grow daily. The erecting shop and the wood-working shops have been enlarged and the last of the old Bessonneau hangars that were used for housing machines have been removed and replaced by a huge steel shed which in outward appearance looks like an Elizabethan half-timbered mansion.

In the erecting shops are two D.H.18s which are being reconditioned for the Air Ministry for test, one of which is to be flown into the sea to see how long it will float,—after which it will probably need re-reconditioning.

Twelve D.H.53s (the light aeroplanes with Blackburne engines) are being built for the Air Ministry and Australia. One D.H.37 (the Sylvia type) is being built for Australia. One D.H.34b (a D.H.34 with larger wings) is being built for the Daimler Airway. And a D.H.51 (a two-seater training machine with an 80 h.p. Renault and dual ignition) and the second D.H.42, or Dormouse (the two-seater fighter with Jaguar or Jupiter engine—reputed to be the best fighter produced since 1918 to Air Ministry specification), are being erected for the Air Ministry. Work has also begun on a third Dormouse built of steel.

In addition the wood-working shop has turned out a large number of small models of aircraft ranging from the first Wright biplane to the S.E.5a and the F.5 flying boat for the Air Ministry exhibit at the forthcoming British Empire Exhibition.

Another large model for the same purpose is of a standard control cockpit which is to be electrically operated so that every movement of the control column and rudder-bar is reproduced on a small model suspended over the cockpit a pointer at the same time indicating on a dial the name of the exact movement that would be carried out by an aeroplane in flight.

Aviation at Wembley.

The Board of the British Empire Exhibition states that the exhibits which are being arranged at Wembley to illustrate the progress of aviation will convey a striking idea of the possibilities of aircraft both as weapons of defence and as an aid to commerce. They will show the value of co-operation between aircraft and the Navy and Army, the potentialities of aircraft as an independent arm, the beneficial services that aircraft can render in time of peace.

For those who wish to study aircraft from the historical aspect a comprehensive series of scale models, complete in every detail of pre-war, war-time, and post-war types of aircraft will be provided.

Realistic demonstrations will be presented of the work done by British aircraft in France, Palestine, and with the Navy.

An attack on London by a hostile air fleet is to be shown in the theatre of the Government Pavilion.

A large scale model of the air route between London and Paris will be shown. A second model will give a complete representation of Croydon aerodrome. And a third model will illustrate the Air Mail Service which is being run by the R.A.F. between Cairo and Baghdad.

Other interesting exhibits at Wembley will include an illustration of some of the methods employed to attain safety in aircraft, examples of aircraft engines and accessories, specimens of the work of the Royal Air Force apprentices, a wonderful collection of paintings of aeronautical subjects, and a comprehensive meteorological exhibit descriptive of the important help given to many branches of industry by the Meteorological Office.

One would like to see at Wembley that wonderful collection of R.A.F. photographs which was shown by the Photographic Section of the Air Force at the Grafton Galleries shortly after the Armistice.

North Pole Airship Schemes.

The officers of the U.S. Naval Air Station at Lakehurst, New Jersey, where the Shenandoah is housed were informed on Saturday, Feb. 21 by the Navy Department that it has been decided to abandon the plans for the flight of the Shenandoah to the North Pole this summer. This decision was taken after a conference at Washington between Rear-Admiral Moffett, Chief of Naval Aeronautics, and Lieut.-Commander Lansdowne, the commander of the Shenandoah. The ship is to be used as an auxiliary with the Scouting Fleet in the Atlantic.

In this connection it is interesting to note that Commander F. M. Boothby has formulated a scheme to attempt to fly to the North Pole in a British airship. He estimates that if the Air Ministry were to approve the scheme and to loan the R.36 for the venture it could be done in four days at a cost of about £5,000. The R.36 has been repaired since she bumped the mooring mast and her gas bags are in quite good condition. Either Napier Lion or Siddeley Puma engines would be installed.

Commander Boothby also has another scheme in preparation for a flight round the World with only four stops. At any rate the money spent on the building of the R.36 would be more justified if some such use as this were found for the ship rather than keeping it put away at Pulham with mothballs awaiting all sorts of schemes for running airship services to Timbuctoo and other such places.

Meantime one suspects that the Burney scheme for an airship line to India and ultimately to Australia will be in full blast long before any airship travels to the North Pole and back, and anyhow there seems little object in flying over the Pole.

An All-Round Man.

One of the most regrettable things about Civil Aviation in general and the sport of flying in particular is that so few well-to-do young men take any interest in the subject. The only owner pilot who has learned to fly since the War is Mr. Alan Butler, the owner of Sylvia, the D.H.37. Fortunately Mr. Butler is one of those men who when he does a thing believes in doing it well and he has taken up aviation very seriously. It will be remembered also that he was connected with the Aerial Survey Company (Newfoundland) Ltd. and still has big interests in Newfoundland.

Furthermore Mr. Butler is now Chairman of Directors of The De Havilland Aircraft Co. Ltd.

Before taking to flying Mr. Butler was keenly interested in sea navigation, not only running his own yacht but actually on occasion shipping before the mast on a cargo steamer. And not very long ago by way of making his sea work complete Mr. Butler qualified for his Master's Certificate, so that he is now entitled to navigate a passenger ship on the high seas.

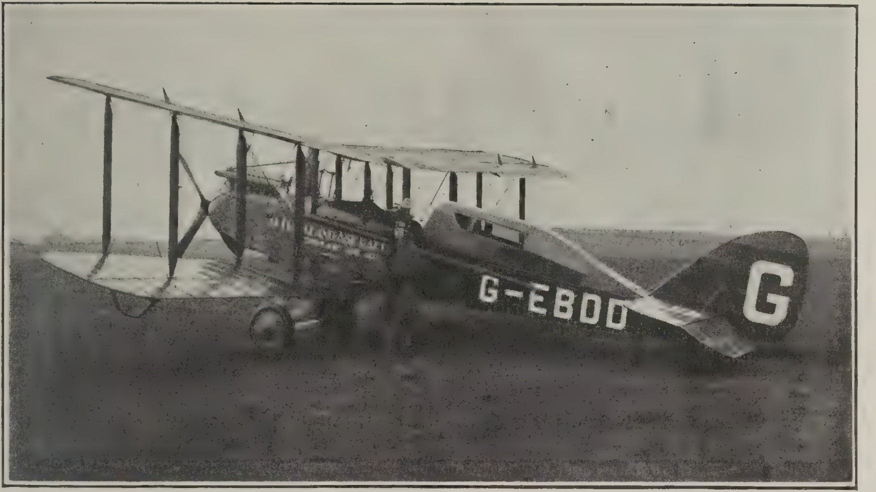
More recently he has passed the Air Ministry test for the Class B. civil pilot's certificate so that he is now entitled to carry passengers "for fee or reward"—the idea of Mr Butler taking up passengers on an Avro at 5s. per head has its humour. Apparently all that is now left for him to do to become the complete aviator is to do an Air Navigation course at Calshot.

Major J. Stewart (of the Aircraft Disposal Co. Ltd.), Captain Cardona (Chief of the Spanish Naval Air Service), Captain Cortijo (of the Spanish Naval Commission in London) and Major J. R. Grant (of the A.D.C.) at the Works of the Aircraft Disposal Company, Ltd., Whaddon, on Thursday. Feb. 21.

DE HAVILLAND AIRCRAFT
IN USE ON
AUSTRALIAN AIR LINE

(Charleville-Cloncurry, 385 Miles.)

Operated by QUEENSLAND & NORTHERN TERRITORY AERIAL SERVICES, LIMITED.



The D.H.9c. Three Passenger Commercial Aeroplane
(230 h.p. Siddeley "Puma" Engine.)

"THE D.H.9c. is entirely satisfactory in every way. Its performance comes right up to our expectations—better, in fact. Before the machines arrived we had been prepared to have to run them full out, and nothing pulls a machine to pieces so quickly. The D.H.9c, to our great relief, is an extremely good weight-lifter and carries 3 passengers (each with 30 lbs. luggage) quite well with the 'Puma' throttled well down. During the first month of the new machines' operations we have carried more freight than in any previous six months."

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Aircraft for Spain.

Capitan Cardona, Chief of the Spanish Naval Air Service, and Capitan Cortijo of the Spanish Naval Commission in London paid a visit recently to the Supermarine Aviation Works at Southampton. As a result of their visit they have placed an order for twelve amphibian flying boats of a new type. They have also purchased a number of machines and a considerable quantity of material from the Aircraft Disposal Company which they visited on Thursday, Feb. 21.

An Important Association.

The Aircraft Disposal Company Ltd. have taken over the goodwill and tangible assets of Martinsyde Ltd. with the exception of the factory at Woking. Martinsyde Ltd. is one of the oldest aeroplane companies in the country and the machines built by them and designed by Mr. G. H. Handasyde are known all over the world.

The Schneider Cup, 1924.

In connection with the previous note in THE AEROPLANE which stated that Italy was considering entering for the Schneider Cup Race which is to be held at Baltimore this autumn, it is now known that four Italian firms are preparing designs for racing seaplanes with official benediction. These are Piaggio, Dornier, Macchi and Cantieri Monfalcone. Four machines will be sent to America, three for the race with one in reserve.

A single-seater scout fitted with the 300 h.p. Hispano-Suiza engine has just been produced by the Piaggio firm and this machine which is designed purely as a service machine made a speed of 290 km. (181.25 m.) per hour, in its preliminary tests, and it is believed that this machine fitted with the Curtiss D.12 engine and an efficient float gear could make a speed of 218 m.p.h

Macchi is designing a monoplane flying boat and the Monfalcone design is a biplane boat. The Dornier design is for a monoplane seaplane.

Models of all these machines are being tested in the Government experimental department.

The U.S. Army's Flight round the World.

The date for the start of the U.S. Army's flight round the World has now been tentatively fixed as Mar. 15, so that if the pilots start to schedule they will leave a clear month ahead of Squadron Leader MacLaren who has fixed Apr. 15 as his date for starting. The point of departure will be Los Angeles.

The British Flight Round the World.

It is reported from Vancouver that Lieut.-Colonel Broome whose name is known to readers of this paper has arrived at Vancouver in order to make arrangements for Sq. Ldr. Maclaren's attempt to fly round the World. He will leave at the end of February for Alaska in the fishery cruiser Thiepval which has been placed at his disposal by the Canadian Government. He will establish twenty fuelling and emergency depots between Vancouver and Tokyo at points about 300 miles apart.

Lieut.-Colonel W. G. Barker will be in charge of the Canadian arrangements of the flight. The machine used will be a Vickers Vulture, a development of the Viking, and it is fitted with a 450 h.p. Napier Lion engine. Two spare engines are being despatched, the one to Tokyo and the other to Toronto. The present date fixed for the start of the flight has now been put on to Apr. 15.

An American Attempt on the Height Record.

Lieut. J. A. Macready on a Lepere aeroplane fitted with a Liberty engine with a supercharger made an attempt on the World's height record last week. The previous record was 36,220 feet by M. Sadi Lecointe on Oct. 30. It was at first reported that Mr. Macready had attained an altitude of 41,000 feet but this was subsequently corrected to 34,983 feet. This beat his own previous record by 474 feet but was just short of the World's record.

Sir Sefton Brancker.

Sir W. Sefton Brancker, Director of Civil Aviation, arrived at Southampton on Sunday, Feb. 24, after a tour of the United States. He said that he was very much impressed by the quality of American airship design. He reiterated the fact which has been plain to all English visitors to the United States that there was very little commercial aviation over there. The only example is the postal service between New York and California which is being run by the Government, and is very successful.

The American Government is paying a good deal of attention to airships, and craft of that type which have already been built greatly impressed Sir Sefton.

An Accident in France.

During a practice fight in the air between aeroplanes of the 35th Aviation Regiment of the French Army, which took place over the aerodrome at Bron, near Lyons, on Feb. 5, two single-seater Nieuport monoplanes came into collision. The two pilots, each of whom was a sergeant, were killed.

Jet Propulsion in France.

According to the Paris correspondent of one of the less reticent of daily newspapers there are at present being completed in the vicinity of Paris no less than twelve aeroplanes which though devoid of either engine or airscrew are yet said to be able to fly at 375 miles per hour.

The basis of this rumour is to be traced to the experiments of one M. Melot who since the War 1914-18 has been experimenting with a system of jet propulsion for aircraft. A mixture of fuel and air under pressure is burnt in a refractory chamber, the hot gas resulting is allowed to expand in its passage through a jet and the heat energy is converted into kinetic energy as in a turbine jet.

This kinetic energy of the issuing gas is communicated by a series of concentric divergent nozzles (similar to those of an injector) to a considerably larger volume of air, and the reaction of the resulting jet of air produces a thrust precisely as does the slip-stream of an airscrew.

The scheme has an attractive air of simplicity but an elementary consideration of the factors governing the efficiency of this method of propulsion indicates that except at a speed very much higher than is yet attainable the prospect of attaining any appreciable over-all efficiency is remote.

At the suggested speed of 375 m.p.h. jet propulsion might conceivably be as practicable as any existing engine and airscrew combination; but for the somewhat necessary process of accelerating from rest to this speed the jet would certainly prove unsatisfactory.

A model of a jet propulsion device of this nature was exhibited, if memory serves, by M. Melot, at the Paris Aero Show of 1919, but despite the long period which has been available for development of the idea it may fairly be doubted if even the French authorities would feel justified in ordering aeroplanes so equipped in the quantity suggested.

The Loss of the Dixmude.

The report of the special High Commission of Inquiry which sat under Marshal Fayolle to inquire into the loss of the Dixmude dismisses the theory of individual responsibility and recommends that the question of collective responsibility should not be pursued. The Commission finds that the destruction of the Dixmude was caused by lightning and that therefore no one was responsible for the actual loss.

The date of the departure of the airship is supposed to have been the most favourable of the whole year for crossing the Sahara and the most favourable of the whole Winter for crossing the Mediterranean. The airworthiness of the Dixmude was considered to be beyond criticism but the arrangements for mooring and refuelling in Northern Africa were inadequate. If there had been a station for this purpose at Tougourt or at Ouargla where the airship left the fine weather zone she could have been taken back to obtain a supply of petrol which would have enabled the journey to Baraki to be made under better conditions.

The previous trials made and the training undertaken also in the opinion of the Commission relieves all concerned from negligence.

A New Sport.

The somewhat doubtful sport which was originated by Mr. Alan J. Cobham of flying into the crater of a volcano has now spread to the Canary Islands. Five Spanish officers, who recently flew in a Dornier flying boat from Spain to the Canary Islands, flew over the Teyde Mountain, the highest point in the Canary Islands and flew down towards the centre of the crater of the volcano. It is reported that they met a discharge from the crater and descended to within fifty feet of the centre at which distance they say as one might perhaps expect that they were much inconvenienced by the sulphurous emanations They returned to their alighting place safely after taking a number of photographs.

Prague as an Air Centre.

Czecho-Slovakia is making great progress in aerial development and is at the present moment displaying a very lively interest in the possibilities of air transport. It has long been desired to make Prague a big junction of European air lines.

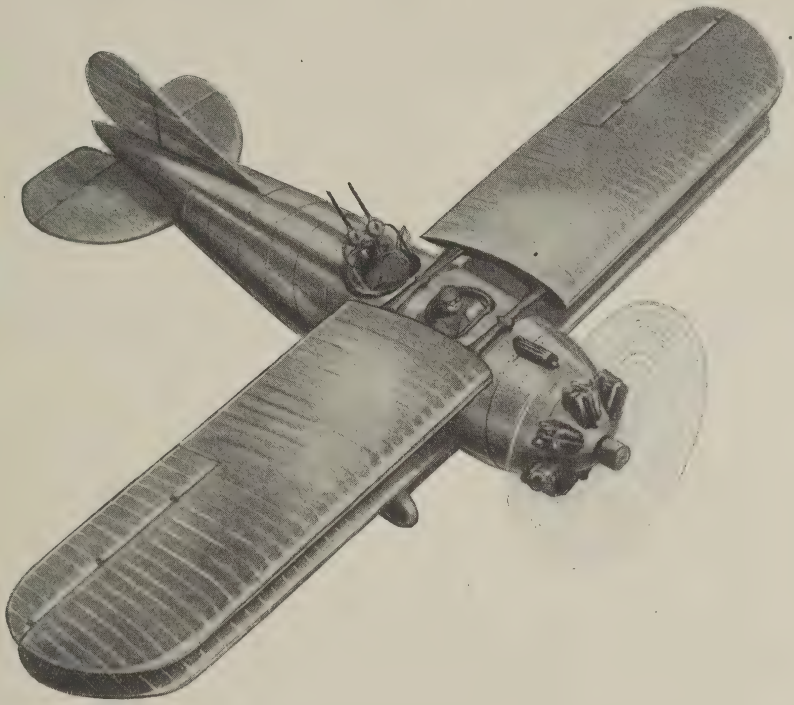
Every year since the War an aircraft exhibition has been held at Prague though no such show has been held in England since 1920. Quite a lot of Czecho-Slovakian machines have been designed, many of which are very good machines indeed.

It is now announced that during the present year an air transport company will be formed in Czecho-Slovakia and will receive a subsidy from the State. It is intended to start six air routes in or from Czecho-Slovakia which will link it with Poland, Russia, Roumania, Hungary, Jugo-Slavia and Italy.

ALL-METAL

AEROPLANES AND SEAPLANES.

Designers and Constructors of All-Metal Aircraft for the British Government.



As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

SHORT BROS.

(ROCHESTER & BEDFORD) LTD,

WHITEHALL HOUSE, 29-30, CHARING CROSS, LONDON, S.W.1.

THE ROYAL AIR FORCE.

Appointments.

Week ending Feb. 25.

General Duties Branch.—Wing Commanders E. M. Murray, D.S.O., M.C., to No. 1 Wing H.Q., India, to command, 10/1; A. ap Ellis, to H.Q., Iraq Command for Personnel Staff duties, 9/1.

Squadron Leaders R. M. Field, to No. 1 Group H.Q., Kenley, 3/3; C D. Breese, A.F.C., to No. 3 Group H.Q., Spittlegate, for Technical Staff duties 1/3; F. Sowrey, D.S.O., M.C., A.F.C, to No 8 Sqdn., Iraq, to command, 5/2; C. B. Cooke, to No. 20 Sqdn., India, to command, 25/1.

Flight Lieutenants H. V. Rowley, to No. 84 Sqdn., Iraq, 19/1; P. H. Davy, to Aircraft Park, India, 26/1; N S. Douglas, to H.Q., Inland Area, 25/2; G. H. Reid, D.F.C., to R.A.F. Depot, Uxbridge, 1/3; M. H. Butler, D.F.C., to I.A.A.D., Henlow, 1/3; R. J. Sanceau, to H.Q., Egypt, 15/2; G. R. A. Deacon, M.C., to School of Army Co-operation, Old Sarum, 25/2; C. A. Stevens, M.C., to R.A.F. Depot, 1/3; T Le G. Pynches, to remain at Marine and Armament, Exper. Estab., Isle of Grain; R. T. B. Houghton, A.F.C., to No. 5 Sqdn., Biggin Hill, 28/2; A. B. Ellwood, D.S.C., to No. 1 School of T.T. (Boys), Halton, 14/2.

Flying Officers I. O'B. MacGregor and W. F. A. Preston, to School of Army Co-operation, Old Sarum, 14/3; J. N. D. Anderson, F. W. Barkley and H. C. Davies, to No. 7 Sqdn., Bircham Newton, 14/3; I E. Brodie, to No. 2 F.T.S., Duxford, 8/3; L. H. Brooke, to R.A.F. Base, Gosport, 14/3; J. J. C Cocks, to No. 27 Sqdn., Bircham Newton, 7/3; U. C. de Burgh, to No 2 F T.S., Duxford, 14/3; H. G. Kirkman, to R.A.F. Base, Gosport, 8/3; O. C. Noel to R.A.F. Base, Leuchars, 14/3; A. R. Prendergast, to No. 2 F T.S., Duxford, 7/3; G. H. Stainforth, to No. 2 F.T.S., Duxford, 7/3; R. Stiven, to R.A.F. Base, Gosport 8/3; V. J. Somerset-Thomas, to R.A.F. Base, Leuchars, 26/2; D S. Cairnes, to No. 2 F.T.S., Duxford, 11/3; N. Liddall, to No. 5 Arm. Car Coy., Iraq, 5/11; R. F. Browne, D.F.C, to remain at No. 8 Sqdn., Iraq; H .Buxton, to Aircraft Depot, Iraq, 29/1; F. J. Knowler, to Aircraft Depot, Egypt, 18/1; T. Sullivan, to H.Q., Iraq Command, instead of to Aircraft Depot, Iraq, as previously notified, 23/11; R. L. Edward, to No. 30 Sqdn., Iraq, 9/1; R. de L. Stedman, to R.A.F. Cadet College, Cranwell, 8/2; A. H. Klynes, to R.A.F. Depot, Uxbridge (Supy.), Non-effective Pool, 25/2; J. Duncan, to Boys' Wing, Cranwell, 1/3; P. Harris, to Marine and Arm. Exper. Estab., Isle of Grain, 29/2; B. H. Cook, to Marine and Arm. Exper. Estab., Isle of Grain, 18/2; G. L. Carter, to R.A.F. Cadet College, Cranwell, 3/3; H. J. Wykes, to R.A.F. Depot, 21/2; J. F. V. Sugars, to No. 5 F.T.S., Shotwick, for course of instruction on transfer to Home Estab., 3/3; H. C. Lee, to R.A.F. Depot, on appointment to a S.S. Commn., 20/2; J G. Western, M.B.E., to No. 4 Sqdn., Sth. Farnborough, 3/3; C. E. C. Penny, to No. 1 School of T.T. (Boys), Halton, 28/2.

Pilot Officers A. H. Grace and T. W. G. Cattell, to No. 2 F.T.S., Duxford, 26/2; V. J. Hatton, to No. 7 Sqdn., Bircham Newton, 14/3; W. D. Baxter, J. E. Doran-Webb, H. V. Kerckhove, M.C., and E. G. Whinney, to No. 2 F.T.S., Duxford, 14/3; R. A. A. Cole, to No. 11 Sqdn., Bircham Newton, 14/3; C. J. A. Delany, to R.A.F. Base, Leuchars, 8/3; J. E. Tomes, to No. 11 Sqdn., Bircham Newton, 26/2; B L. Young, to No. 7 Sqdn., Bircham Newton, 26/2; S. A. Young, to No. 2 F.T.S. Duxford, 8/3.

Medical Branch.—Squadron Leader (Medical) P. T. Rutherford, O.B.E., to Egyptian Group H.Q., 30/1. Flight Lieutenant (Medical) E. G. S. Hall, M.B., to No. 208 Sqdn., Egypt, 25/1; E. A. Lumley, M.C., M.B., to Aircraft Depot, Egypt, 2/2; A. E. Barr-Sim, M.B., to Baghdad Combined Hospital, Iraq, 27/1. Flight Lieutenant (Dental) H E. Flavelle, to No. 1 School of T.T. (Boys), Halton, 28/2.

Stores and Accountant Branch.—Squadron Leader (Stores) F. G. M. Williams, to Inland Area H.Q., 1/3. Flight Lieutenant (Stores) F. R. Wilkins, to Miscellaneous Details, Andover Station, 1/3 Flying Officers (Stores) P. H. Burt, to C.F.S., Upavon, 25/2; W T. Lewis, to Electrical and Wireless School, Flowerdown, 25/2; G. Scarrott, to School of T.T. (Men), Manston, 25/2; E. A. Burridge, to Aeroplane Exper. Estab., Martlesham Heath, 25/2. Pilot Officers (Stores) C. W. Gore, to No. 1 F.T.S., Netheravon, 25/2; M. W. Keey, to No. 111 Sqdn., Duxford, 25/2.

London Gazette.

Feb. 19.

General Duties Branch.—H. W. Taylor is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, Feb. 11; G. R. A. Pallin is granted a S.S. commn as a Plt. Off. on probation, with effect from, and with seny. of, Jan. 31; Flt. Lt. A. B. Ellwood, D.S.C., is placed on half-pay, Scale B, from Jan. 1 to Feb. 13, inclusive (substituted for the notification in *Gazette* of Jan. 8).

Reserve of Air Force Officers.—The follg. officers are confirmed in rank, with effect from the dates indicated :—Flg. Offs. A. M. Anderson, D.F.C., C. H. Graham (Jan. 29); M. N. Hancocks (Feb. 1); R. Jarman, D.S.C. (Feb. 2); S. Jones, D.F.C. (Feb. 14). Plt. Offs. I. J. Sankey, E F. Smith (Feb. 14).

The Wakefield Scholarships.

The Air Ministry announces :—The Wakefield Scholarships awarded to cadets entering the R.A.F. (Cadet) College in Jan., 1914, have been gained by Mr. A. W. B. Hale, who passed into the College as a result of the competitive examination held in Nov. last, and Mr. H. D. Spreckley. The latter was selected from amongst the aircraft apprentices who were chosen to proceed to the Cadet College after completing, in Dec. last, their three years' course at the R.A.F. training schools for aircraft apprentices.

In 1920 Sir Charles Wakefield, Bart, C.B.E., offered to provide two scholarships per annum, each of the annual value of £75 and tenable for two years, with a view to giving financial assistance to successful candidates for entry into the R.A.F. (Cadet) College, whose parents are in reduced circumstances.

Sir Charles has now kindly extended the period of his offer for a further three years under revised conditions. Under the new conditions four scholarships, each of £75 but tenable for one year only, are offered per annum, two for each half-yearly entry. One of these is given for competition at the open competitive examination held in June and Nov for admission to the R.A.F. (Cadet) College, and one to the top boy of the aircraft apprentices who are specially selected for cadetships twice a year at the end of their three years' training as aircraft apprentices.

The R.A.F. Reserve in Manchester.

According to the Manchester Guardian of Feb. 22 a selection board of officers of the R.A.F. under the Presidency of Group Capt. the Hon. J. D. Boyle, is sitting in Manchester at the Headquarters of the 6-7th Manchester Regt in Stretford Road, for the purpose of interviewing candidates for the R.A.F. reserve. The Board hopes for at least 50 applications from the Manchester district and already between 30 and 40 have been received. Most of the candidates are of junior rank in the Service, there having been very few applications from pilots with a long war experience. There is no recruiting at present for other ranks in the Reserve.

The Fleet Air Arm.

The following is taken from the Naval and Military column of *The Times* of Feb. 26 :—

> At the Admiralty to-morrow, Commander R. B Davies, V.C., D.S.O., A.F.C., will hand over the duties of chief of the Naval Air Section, which he has discharged since August, 1920, to Captain T. F. P. Calvert, D.S.O., from the Training and Staff Duties Division. The Naval Air Section assists the Board in the consideration of all air problems relating to sea warfare from the naval standpoint, advice on the air side being in the province of the Air Ministry. It maintains touch with the various branches of the Air Staff which deal with the aeronautical side of Fleet warfare, and also with the technical branches of the Air Ministry which deal with *matériel.* At the time of the Armistice there were 14 officers in the section, but at present the number is only two, one each from the executive and accountant branches.

55 Squadron Re-union.

The Annual Re-union Dinner of the 55 Squadron Association will be held on Mar. 8 at 8 p.m.

Members are requested to forward their subscriptions for the current year, with an intimation as to whether they will be able to attend the dinner, to the Hon. Sec. Sq. Ldr. Nicholas, A.E.E. (Home) Martlesham Heath, at the earliest possible moment.

The R.A.F. Cadet College Magazine.

The Spring Number of the Cadet College Magazine contains some exceptionally interesting articles, the best of which perhaps is an account of the operations of "H" Unit, R.A.F. in the Sudan. The author Flg. Off. G. C. O'Donnell describes the first offensive patrol in 1914 against the Garjak Nuer tribe whose country is in the South-East Sudan on the border of Abyssinia. This expedition was somewhat interrupted by a larger expedition elsewhere in the same year and it was not until 1919 that "H" Unit, R.A.F., arrived at Khartoum consisting of five officers, 23 other ranks, one light tender and one workshop lorry. The troops and three aeroplane cases were loaded into a Nile steamer and arrived at their destination, Nasser Post, about a fortnight later. The R.A.F. duties were reconnaissance, bombing, machine-gun attacks and mail carrying and the difficulties of work over unmapped country and under bad atmospheric conditions are vividly described.

Another interesting article is on Ibex Stalking in Ladakh, an amazingly good way of spending leave in India.

There are a few good photographs in the Magazine but the two pages of sketches are badly drawn and in worse taste On the other hand N.Y.'s article on Home Defence is distinctly funny

New Zealand Air Personnel.

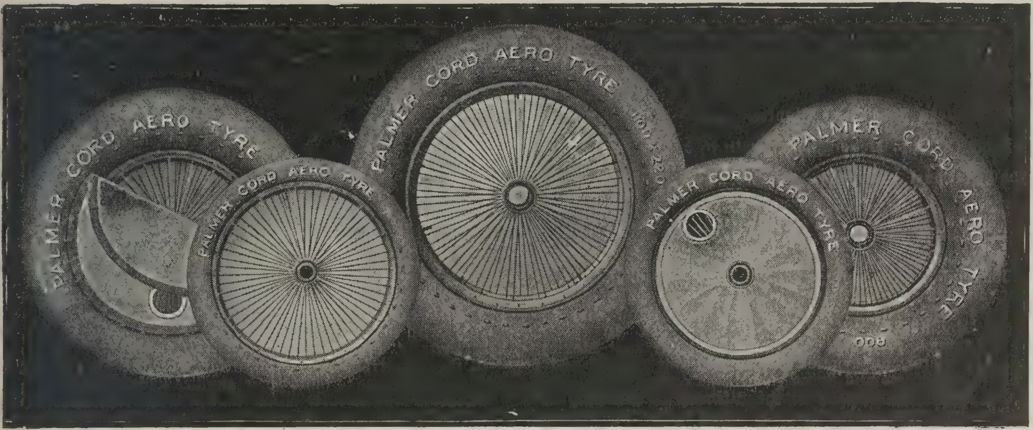
The Times' own correspondent in a message from Wellington, New Zealand, dated Feb. 25, states :—

> The Government is considering the proposals of the British Air Council to grant short service commissions in the Royal Air Force to Dominion candidates. The scheme involves one year's training four years on the active list, and four years on the Dominion reserve. The plan makes possible the creation of a strong reserve of trained pilots throughout the Empire without the expense to the smaller Dominions of equipping, training, and technical establishments. The Minister of Defence, Mr. Rhodes, states that the Government is prepared to consider the scheme favourably when the financial details have been received.

[This is the first public intimation of the Air Ministry's proposals. It is understood that the same proposal has been made to the Governments of Australia, Canada and South Africa as the result of discussion at the Imperial Conference in 1923.—Ed.]

PALMER

LANDING WHEELS & TYRES



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Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
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,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132 46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	36*	185.	55.	135/50
,,	40*	185.	60.32	135/50
,,	152	185.	66.67	135/50
,,	163*	185.	66.67	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60
,,	141	250.	80.	Central
,,	201	185.	60.32	125/60
1000×150	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

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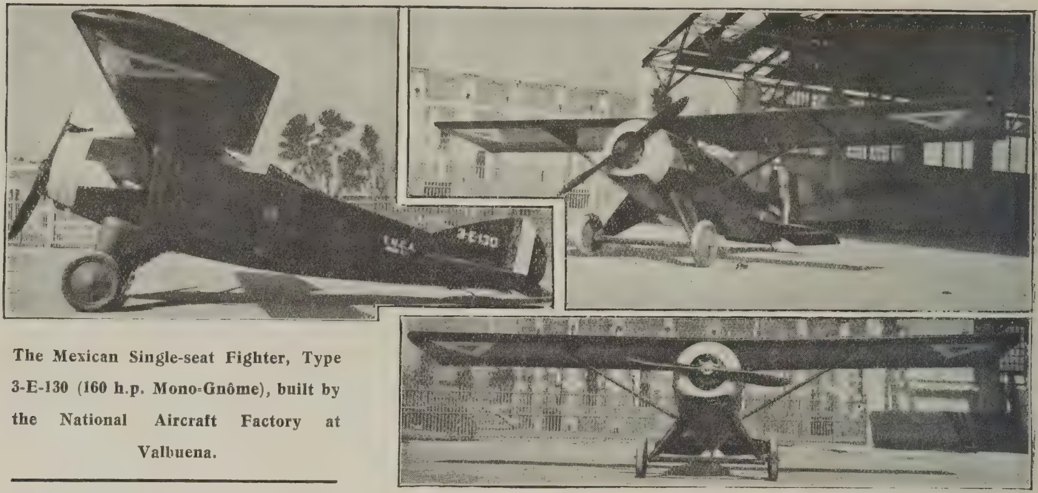
U/N/NN.

SOME NEW MEXICAN AIRCRAFT.



The Mexican Single-seat Fighter, Type 3-E-130 (160 h.p. Mono-Gnôme), built by the National Aircraft Factory at Valbuena.

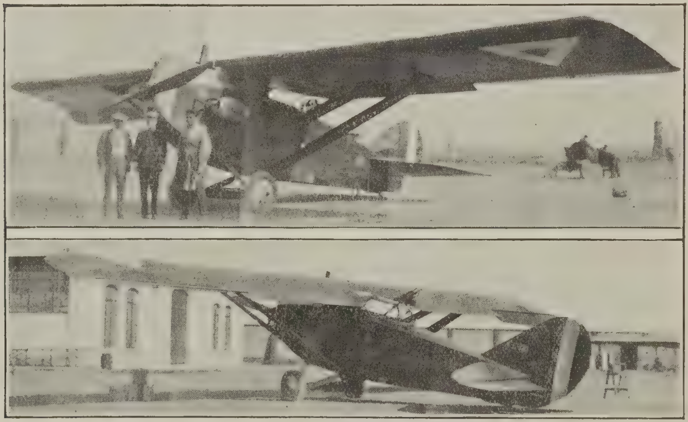
Mexico has for a long time been regarded as a seat of rebellion and insurrection and it is not generally known that apart from the distinction of being almost the first country to have employed aeroplanes in actual warfare, they are actually building aeroplanes of original types. In 1915 at the instigation of Major Albert Salinas, the first Mexican military aviator, an aviation department was created and a military aerodrome and flying school was opened at Valbuena near Mexico City. Owing to the difficulty of obtaining aircraft from Europe at this time and owing to the then strained relations with the United States it was decided to begin the construction of national aircraft.

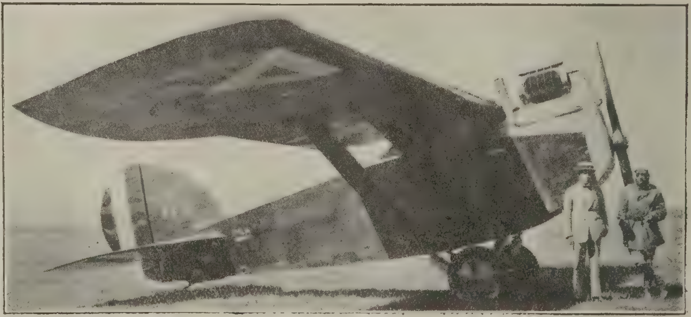
This led to the foundation of the National Aircraft Factory at Valbuena which began work in November, 1915. The factory was very fully equipped with modern machinery and at first a number of Bleriot and Morane-Saulnier monoplanes were built and fitted with such aero engines as had survived the revolutionary campaigns or could be obtained elsewhere. A number of tractor biplanes were also built together with a radial engine of the Anzani type known as the "Aztatl" of 80 h.p.

In 1917 an arrangement was made with the Hispano-Suiza Co., of Barcelona, to build their engines under licence.

In 1918 a single-seater scout known as the Microplano and fitted with a 180 h.p. Hispano-Suiza engine was built to the designs of Senor Santarini and later a two-seater training biplane fitted with the 80 h.p. Aztatl engine was constructed.

More recently information has been received from the National Aircraft Factory, concerning three of their latest productions. They are all of the semi-rigid monoplane type and are fitted with the 80 h.p. Le Rhône, the 160 h.p. Mono Gnôme and the 185 h.p. B.M.W. engines. All three types embody the same type of construction, and are to the designs of the Director-General of the Aircraft Factory, Sr. Angel de Lascurain y Osio. In general the aim of the construction has been to eliminate as much as possible all fittings which add weight to the machine and thereby impair its lifting capacity. In this connection it is interesting to note that the aerodrome at Valbuena, Mexico City, is 2,240 m. (7,347.0 feet) above sea level and that the performance of these machines was obtained in test flights from this aerodrome. Most of the skeleton is made of spruce and covered with three-ply veneer. This type of construction has given every satisfaction and in all machines a factor of safety of 7 was obtained without adding excessive weight to the structure. The wing sections are all of the Jowkowsky type and all material used in the





The Quetzalcoatl Two-seat Light Bomber and Reconnaissance Machine (185 B.M.W. engine). In the upper photograph is shown the later edition. The lower photograph is the original of the type. The difference is mainly in the use of a single top radiator in the original and two side radiators in the later type.

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machines, with the exception of the engines, together with all personnel engaged in the design and construction are of Mexican origin.

The 5-E-132 of which no illustration is available is a two-seater training monoplane fitted with the 80 h.p. Le Rhône engine of which the following is the specification :—

Wing area	26 m^2. (280 sq. ft.)	Weight of fuel	80 kgs. (176 lbs.)
Weight light	580 kgs. (1,276 lbs.)	Max. speed	120 km.p.h. (75 m.p.h.)
Weight loaded	800 kgs. (1,760 lbs.)	Min. speed	64 km.p.h. (40 m.p.h.)
Useful load	140 kgs. (301 lbs.)	Ceiling ...	5,000 m. (16,400 ft.)
		Petrol capacity	2 hours.
		Wing Section ...	Prandtl 430.

The 3-E-130 shown in the illustrations is a single-seater scout fitted with a 160 h.p. Mono-Gnôme engine and two Vickers guns.

SPECIFICATION.

Wing area	16 m^2. (170 sq. ft.)	Useful load	98 kgs. (216 lbs.)
Weight light	670 kgs. (1,474 lbs.)	Weight of fuel	92 kgs. (202 lbs.)
Weight loaded	860 kgs. (1,892 lbs.)	Max. speed	225 km.p.h. (140 m.p.h.)
Min. speed	76 km.p.h. (47 m.p.h.)	Ceiling ...	6,000 m. (19,700 ft.)
Climbing speed ...	1,000 m. (3,280 ft.) in 2 m. 36 s.	Petrol capacity ...	1½ hours.
		Wing section ...	Prandtl 430.

The 4-E-131 or Quetzalcoatl is a two-seater light bomber or reconnaissance monoplane fitted with an 185 h.p. B.M.W. engine. This machine, which is also illustrated, is shown with both one and two Lamblin radiators the latter form with two radiators, one mounted on either side of the fuselage, being the more recent type. This machine carries 250 kgs. of bombs and has been used in the recent rebellion with success. The armament consists of one fixed Vickers gun firing forward and a twin Lewis gun mounting on a Scarff ring over the observer's seat.

SPECIFICATION.

Wing area	33 m^2. (355 sq. ft.)	Max. speed	200 km.p.h. (124 m.p.h.)
Weight light	1,130 kgs. (2,486 lbs.)	Min. speed	75 km.p.h. (46 m.p.h.)
Weight loaded ...	1,750 kgs. (3,850 lbs.)	Climbing speed	1,000 m. (3,280 ft.) in 4 mins.
Useful load	390 kgs. (858 lbs.)	Ceiling ...	6,500 m. (21,300 ft.)
Weight of fuel	230 kgs. (504 lbs.)	Petrol capacity	5 hours.
		Wing section ...	Prandtl 413.

AERIAL PHOTOGRAPHIC SURVEYING.

The paper entitled Some Features in the Present Position of Aerial Photographic Survey read by Mr. H. Hamshaw Thomas before the Royal Aeronautical Society on Thursday Feb. 22 was largely devoted to an account of the development work which was carried out at Cambridge by the late Major J. C. Griffiths who unfortunately lost his life in a flying accident in October. Major Griffiths who at the outbreak of war was a student of Engineering and Geology at the University of Liverpool joined the Flying Services rose to the rank of Major and commanded a Squadron of the R.A.F. in France.

On demobilisation he returned to Liverpool to complete his course, but inspired by his flying experience with the idea of developing the use of the aeroplane for topographical and geological surveying. As a result after completing his course at Liverpool he went up to Cambridge as an advanced student to carry on research in aerial surveying in the newly-established aeronautical department of the University.

WAR SURVEYS BY AIR.

At the end of the war aerial photography had been applied extensively in France for the correction and the addition of features to maps of an area already accurately surveyed. There were large numbers of features whose position was accurately known from the existing surveys and single photographs could be used and corrected from these known fixed points.

In Palestine large areas not accurately surveyed had been mapped from the air giving maps which showed detail in great relative accuracy, but in which the absolute position in space of individual points might be somewhat incorrect. Major Griffiths' idea from the first was the development of methods for the survey of new or undeveloped countries where no accurate ground survey had been made, and his early interest centred round the type of work which had been done in Palestine, that of mapping from a series of vertical photographs, depending upon the ability of a trained pilot to fly over a line of country maintaining a closely uniform height, and keeping his machine level to within very close limits.

The experience of Palestine indicated that with care, tilts of more than 3° were rare and that tilts of not more than 2° did not greatly damage the value of vertical photographs for mapping purposes. But those whose experience was confined to aerial survey in France were sceptical as to the possibility of reasonable accuracy by this method.

The work carried on by Major Griffiths at Cambridge was devoted to the development of methods of securing the necessary accuracy in the taking of photographs, and to methods of simplifying the compilation of maps from the photographs.

THE PRELIMINARY RESEARCH.

The first part of the work took the form of taking a large number of strip photographs on straight line flights and determining the accuracy with which the pilot could fly level and at a uniform height by comparing measurements on the plates with measurements on the ordnance survey maps. This process of checking was extremely laborious and incidentally showed that the labour of compiling a map by a process of direct measurement was far too great to be used when a rapid and economical survey was necessary. But the result showed that a trained pilot could be relied upon rarely to exceed 2° of tilt on the camera and 100 ft. variation above or below the mean height of the flight.

An attempt was then made to survey Blakeney Harbour on the Norfolk coast an area entirely unknown to the pilots. It was found that when the pilot had to concentrate on completely covering a definite area, the accuracy of level and height suffered, and that conversely, if he concentrated on these points his courses were not accurately parallel one to another and parts of the area were missed. As the result of further experiment, involving the test of various instrumental aids to accurate steering of a course, equipment and a systematised procedure was evolved which overcame this difficulty.

A TEST SURVEY.

The method was then tested by making a survey of a square fifteen miles by fifteen miles round Cambridge. This area of 225 square miles was covered in about two days' flying, and the resulting photographs were used to test a new method of map compilation devised by Professor Jones and Major Griffiths. The photographs were made into a mosaic in the usual way, and the whole mosaic was then adjusted to fit the position of four control points roughly at the corners of a ten-mile square. A systematic comparison of the position of points on the adjusted mosaic with the true position of these points shown on the Ordnance Survey showed a maximum error of 130 yards, and a majority of errors of less than 60 yards. This result is surprisingly accurate—for most purposes the error may be neglected.

While this work was in progress Major Griffiths was approached by certain persons interested in the survey of a large tract of timber territory in the Far East where there is no possibility of fixing points ten miles apart by ground survey. This raised the question of the possible accuracy of aerial survey when known fixed points were 50 to 100 miles apart.

PRIMARY SURVEY BY AERIAL METHODS.

Experiments on what is known as "navigational control" were started. The method was to take a series of strips of photographs at equal distances on parallel courses of about 50 to 100 miles in length. This series of strips would then be crossed by another similar series at right angles to the first series. The starting points of the strips would be determined accurately from ground survey, and as far as was possible the ends of the strips would be carried on to known ground. The whole area would thus be divided up into squares of about 10 miles a side, and it seemed probable that the corners of each square could be fixed to within a quarter to a half-mile of their actual position when the control points were fifty miles apart.

This work was not completed when Major Griffiths left Cambridge for Coventry, but it has made considerable progress and it is hoped that it will be completed in the near future. The degree of accuracy obtainable seems to be sufficient to make the method valuable in forest or bush country where a primary survey is needed.

The detail in individual squares could be filled in either by a mosaic of vertical photographs, or where great detail was not required from oblique photographs.

This work—very largely carried out by Major Griffiths—has gone far to develop a scheme of aerial survey applicable to large unexplored tracts of that country. Possessing the general character of methods used in certain war surveys it differs in that the probable error at each stage is known and that the precautions necessary to ensure accuracy have been explored and instruments to facilitate the work have been devised and tested.

This method of survey is applicable only to relatively flat countries. Over high mountains vertical photographs will

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vary greatly in scale and can only be of local application. Nevertheless the work done contains elements which will be of value for the development of survey work over mountainous regions

THE USES OF AERIAL SURVEY.

Following the account of the experimental work at Cambridge which has been abstracted above, the paper discusses the practical value of aerial survey, particularly by the method of vertical photographs.

The extreme rapidity with which large areas can be covered is specially valuable in undeveloped countries, and a good deal of attention is drawn to the use which has already been made of aerial photography in Canada and the United States. The lecturer points out however that the extreme accuracy of detail given by aerial photographic surveys may render the process extremely useful even in highly-developed countries such as England.

There are cases—such as that of Blakeney Harbour—where very rapid topographical changes in detail are occuring. Aerial photographs provide a method of recording such changes in a very short period and at a very low cost, and in complete detail. The cost of ground survey methods make it impossible to keep maps up-to-date in such cases. Mr. Thomas instances the invasion of Southampton Water in 1870 by a new species of salt marsh grass which now covers large areas of what were mud flats exposed only at low water, considerably altering the appearance of the banks, and which may ultimately influence the course of the main channel to Southampton. This is an effect that could cheaply and accurately be watched and recorded by aerial photography at a fraction of the cost of other available methods.

The paper as a whole is of very considerable interest and deserves to be read in the original by all who are interested in the development of aircraft for utilitarian purposes as well as by those specifically concerned with aerial surveying.

Lower-Power Flying.

A paper with the above title, read before the Institution of Aeronautical Engineers on Friday, Feb. 22, by Mr. W. O. Manning, was based on the results which have been attained during the last year and in particular at the Light Aeroplane Competition at Lympne in October.

The general ideas which determined the design of the well-known Wren monoplane were first discussed, and the lecturer then considered some of the results obtained with light aeroplanes and the lessons to be obtained therefrom. Provided that an adequate rudder is fitted, ordinary practice in the design of ailerons and elevators seemed to provide adequate controls in these small machines. In one respect the light aeroplane had shown a valuable quality in that owing probably to the large degree of lateral damping there was no tendency to drop one wing suddenly when stalled.

Mr. Manning was of the opinion that it was advisable to keep to the two cylinder engine as far as possible, owing to the simplicity of the type and the ease with which it can be overhauled. The objection that failure of one plug seriously reduces the power available was equally true for any engine that could be used and the more cylinders the more chances of plug failure.

A water-cooled engine and wing radiator might allow a cleaner design than the air-cooled type, but it was doubtful whether the extra complication and weight would be worth the possible gain.

The use of small diameter directly-driven airscrews at Lympne had been a source of astonishment, particularly to French visitors, who found it difficult to believe that any appreciable efficiency could be attained. Where geared down airscrews were used at Lympne it was probably done with a view to getting the maximum power from the engine. The small high-speed airscrew had the advantages of low weight and simplicity; it also allowed the cutting down of ground clearance and saved undercarriage resistance. As a general rule, where two alternative methods of doing anything offered advantages so evenly balanced that it was difficult to decide on their merits, the simplest should be adopted.

Instruments for small machines deserved consideration. The speed indicator on the Wren weighed slightly more than the engine mounting. Very much lighter instruments could and should be provided and larger machines would benefit thereby.

From 1913 to 1922 there had been practically no improvement in the aerodynamic efficiency of aeroplanes, the improvement in performance being due to the greatly improved engines. Although the possibility of improving the aeroplane had occurred to several people in this country it was only when the German glider trials and their results became known that these ideas took concrete shape. The glider trials at Itford showed the possibility of improvement and last year's Lympne meeting produced machines which showed marked aerodynamic improvement over everything previously built in this country.

The immediate result was that it was now possible to produce a training machine which in first cost, cost of maintenance, of fuel and of oil could save the R.A.F. many thousands a year. The principal object of this year's competition was the development of such machines.

At present the efficient types of machine, such as were seen at Lympne, can only be built in small sizes as the structure weight would become excessive in large machines. The author had no doubt that in time commercial machines of 10,000 lbs., with a speed of 100 m.p.h., loaded to 40 lbs. per h.p., would be constructed.

Mr. Manning did not agree with the school of thought which held that experiment with pure gliders was the right method. In the glider L/D was important alone and weight did not matter. The tendency would be to improve this by using enormous aspect ratios, which meant heavy weight.

Landing Speeds and Racing.

In an editorial note on Racing Speeds published on Jan. 16 the suggestion was made that the Racing Committee of the Royal Aero Club would be well advised to fix an upper limit of 50 m.p.h. for the landing speed of machines competing in the Aerial Derby, or similar races.

Mr. H. P. Folland in a letter recently received takes objection to this suggestion on the ground that the proposed limit is too low, and that if the landing speed is limited to such an extent the curve of attained speed instead of proceeding upwards will revert to figures such as were obtained in 1921. Mr. Folland points out that the racing machines built and entered for the great races are very carefully tuned up, the risk of forced landing should be small, and that a landing speed of 75 m.p.h. for such a machine can scarcely be regarded as excessive when it is remembered that commercial passenger carriers in regular service have a stalling speed of 65 m.p.h. or more.

It appears that Mr. Folland has no objection to the fixing of 75 m.p.h. as the landing speed of racing machines, and that his objection is less to the principle of fixing a limit than to the choice of 50 m.p.h. for British events. This is easily understandable when it is remembered that 75 m.p.h. has been adopted as a limit in the United States for racing machines, and the adoption of a lower limit in this country would handicap British designers in the attempt to equal the speeds attained in the Pulitzer Trophy Race.

The nature of the ground over which British races must necessarily be contested has however to be taken into account. Great Britain generally speaking is not a good forced landing ground, and in a race such as the Aerial Derby a pilot cannot afford to deviate from the direct course in order to keep within reach of reasonably good landing fields, neither can he afford to climb to a great altitude. In this respect the racing pilot is in a worse case than the pilot of a commercial machine who not only may but must on occasion choose his course on the ground of safety rather than of celerity.

In the case of the Aerial Derby the conditions in this respect are distinctly bad, and it is open to question whether the existing course should not be modified on this account. By all means let there be events for machines with landing speeds of 75 m.p.h. or even more, provided that courses are chosen for these events which give adequate facilities for landing at high speeds. But for events such as the Aerial Derby a low limit of landing speed seems necessary on the grounds of safety, and desirable as an encouragement to the building of fast machines possessing other qualities.

An unlimited, or unduly high landing speed encourages the building of pure speed types—which is in itself desirable. But such machines are extremely expensive to build and few of them are likely to be produced. The low landing speed limit to some extent operates in the direction of encouraging a lighter and less expensive type of machine, and therefore to encourage the building of machines for races to which the limit applies. It may in fact be expected to produce something of the effects of a class rating in making racing possible at a relatively low cost.

The Institute of Transport.

At an ordinary meeting of the Institute of Transport which is to be held on March 3 at 5.30 p.m. in the Lecture Theatre of the Institution of Electrical Engineers, Victoria Embankment, a paper on Air Transport and its Uses will be read by Mr. G. Holt Thomas.

This lecture may be expected to be of very considerable interest and importance, and non-members of the Institute wishing to be present would do well to make an early application to the Secretary at 15, Savoy Street, Strand, W.C.2, for tickets.

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COMMERCIAL AERONAUTICS.

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 14; Tuesday, 4; Wednesday, 14; Thursday, 9. Friday, 12; Saturday, 11; Sunday, 4.

LONDON—PARIS—ZURICH:
Handley Page Transport, Ltd., machines 16, passengers 56, freight 6,002 lbs.

LONDON—OSTEND—COLOGNE:
Instone Air Line, Ltd., machines 15, passengers 18, freight 15,770 lbs.

MANCHESTER—LONDON—ROTTERDAM—AMSTERDAM—HANOVER—BERLIN:
Daimler Airway, machines 18, passengers 7.

PARIS—LONDON:
Air Union, machines 11, passengers 20, freight 11,492 lbs.

LONDON—ROTTERDAM:
K.L.M., machines 8, passengers 12

SPECIAL MACHINES: 0.

Total number of trips by British machines: 49, carrying 81 pas. Foreign machines: 19, carrying 32 passengers

COMPARATIVE FIGURES:
For week ending Feb. 24:
Machines, 68; Passengers, 113; Crews, 113; Total personnel, 226.
Corresponding week, 1923.
Machines, 42; Passengers, 102; Crews, 76; Total personnel, 178.
Corresponding week 1922:
Machines, 45; Passengers, 81; Crews, 74; Total personnel, 155.
Corresponding week, 1921:
Machines, 30; Passengers, 32; Crews, 38; Total personnel, 70.

Croydon Notes.

The passenger traffic is keeping more or less regular and the goods traffic is still showing a steady increase.

On Wednesday of last week a Vickers "Vulcan" was used to bring from Cologne (Köln) to England the body of a Mr. Carlisle an Englishman who had been killed in Germany in a motor accident. The body was transferred to a motor-hearse at Croydon and taken to Warrington.

A curious incident occurred on Friday. A man rang up the aerodrome to book a passage to Cologne. On being told that all machines thither were filled he asked to have a seat reserved to Paris. The traffic manager of the Instone Air Line with memories of absconding financiers thought this desire to fly anywhere somewhat curious and informed the C.I.D. people. They communicated with Scotland Yard who visited the man's house and found a note stating that he had decided to commit suicide by jumping from an aeroplane.

When the man arrived at the aerodrome at 12 o'clock he was informed that the machine had just left but that he could travel on the one o'clock machine (which as a matter of fact was non-existent). Meanwhile his friends were found and eventually they arrived at the aerodrome and took him away.

A Goliath belonging to the Air Union tipped up on its nose in a forced landing at Mersham near Ashford on Saturday. The machine had been compelled by weather to land at Abbeville the previous night. The incident at Mersham is said to have been caused by engine trouble. There was only one passenger, a Miss Morrison, and she was uninjured.

The Compagnie Franco-Roumaine.

A letter has been received from the Compagnie Franco-Roumaine de Navigation Aérienne in which they protest against a paragraph that appeared in an article by a German correspondent entitled "The Present State of Aviation in Germany." This paragraph was headed "The French Attitude" and said—

> ". . . The service indeed is in the hands of the Cie Franco-Roumaine but there can be no doubt that in this case we have to deal with a purely military and political undertaking. This becomes at once evident when the small number of passengers carried and the unremunerativeness of the Service are taken into account."

Their letter is unfortunately rather long but as one is unable to print it in full one willingly brings out the salient facts.

The company points out that any means of transport or rapid inter-communication, be it by railways, motor transport, wireless stations, and even taxi-cabs, having in mind the incident of Sept. 6, 1914, when French troops were rushed into action from Paris to the Marne, possess a military use. Politically every means of transport from aeroplanes to steamships which shows the flag of any particular State in foreign countries has the result of showing economic expansion of that State and is a precedent to commercial expansion and if the fact of securing international commerce by means of air transport is political then surely it savours of political economy.

As to the statement which refers to "the small number of passengers carried"—the Cie Franco-Roumaine point out that in 1923 they carried 1,735 passengers, and over 100,950 kgs. of freight. Their machines carry a useful load of 400 kgs. and they have in nearly every case carried a full load. Numbers of passengers have been turned down owing to the quantity of freight to be carried and they have even doubled and trebled their machines in an effort to cope with their goods service.

From a military point of view naturally in case of necessity the French Government has first call on its equipment, matériel and personnel but this is a state of affairs that exists in every country that employs air-transport.

[The reference made by THE AEROPLANE'S German correspondent to the Compagnie Franco-Roumaine was not meant in any way as an attack on the company. The intention was to point out that without the heavy Government subsidy—which is allotted in the main for military reasons—the company could not continue to exist for even the most limited period. The commercial receipts of the company are inconsiderable.—ED.]

The Royal Aero Club.

The Annual General Meeting of the Members will be held at 3, Clifford Street on Mar. 31, at 5 p.m.

All notices of Motion signed by at least five Members must be received not less than 21 days before the meeting.

Nominations for the Committee, signed by two members must be received not less than 14 days before the meeting.

Receivership.

WYCOMBE AIRCRAFT CONSTRUCTORS, LTD.—G. A. Brigstocke, of Basildon House, Moorgate, E.C.2, ceased to act as Receiver or manager on Feb. 11, 1924.

New Technical Literature.

Aeronautical Research Committee. R. & M. No. 810. The Accuracy of Sextant Observations taken from Aircraft. By B. Melvill Jones, M.A., A.F.C. Price 1s. net.

R. & M. No. 829. Experiments with a Family of Airscrews including the Effect of Tractor and Pusher Bodies Part I. Experiments with the Family of Airscrews mounted in front of a Small Body. B. A. Fage, C. N. H. Lock, R. G. Howard and H. Bateman. Price 3s. 6d. net.

Handbook of the L.B. type Aero-Camera. (Air Publication 79.) H.M. Stationery Office. Price 3s. 6d. net.

PERSONAL NOTICES.

ENGAGEMENTS.

HAIG—HUDSON.—The engagement is announced between Flt. Lt. R. de Haga Haig, R.A.F., son of Col. H. de Haga Haig, late R.E., and Mrs. Haig, and Valérie, daughter of Mr. and Mrs. Robert Hudson, of Westwood, Tuxford, Notts.

SMART—CORKE.—The engagement is announced, and the marriage will shortly take place, between Sq. Ldr. H. G. Smart, O.B.E., D.F.C., R.A.F. and Doris, eldest daughter of Capt. F. Corke, R.E., and granddaughter of Sir John Corke K.L.H., of Portsmouth.

MARRIAGE.

FRANCIS—LILLYWHITE.—On Feb. 14, at St. Paul's, Chichester, by the Rev. F. H. Francis, Hugh Arthur Francis, A.F.C., R.A.F. (Reserve), fourth son of Dr. and Mrs. Francis, of Uxbridge, to Frances Hayler Lillywhite, only daughter of Mrs. and the late John Lillywhite, Esq., of Westhampnett, Chichester.

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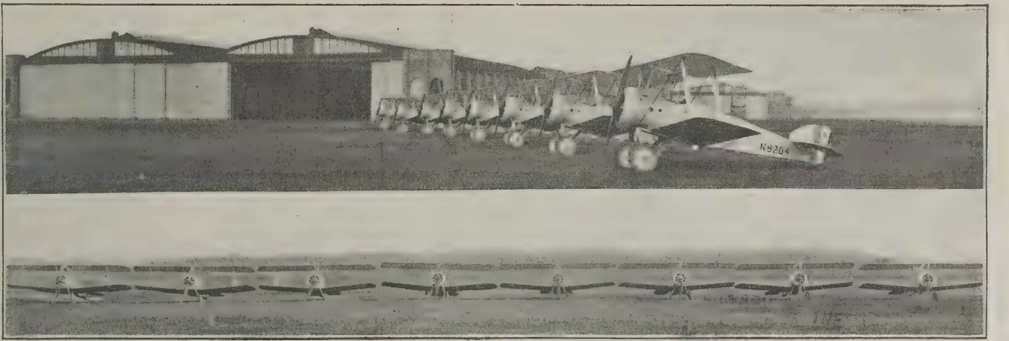
THE AEROPLANE
INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

Vol. XXVI. No. 10. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"THE CAMEL'S BACK."



OLD FRIENDS:—Here is seen a batch of eight Sopwith Camels at Brooklands which have recently been reconditioned by the Hawker Engineering Company. The machines were completely rebuilt and handed over to the Air Ministry within three weeks of being received at the works at Kingston. They are to be used in certain naval co-operation experiments. Thus the Camel comes back to the R.A.F. after many days.

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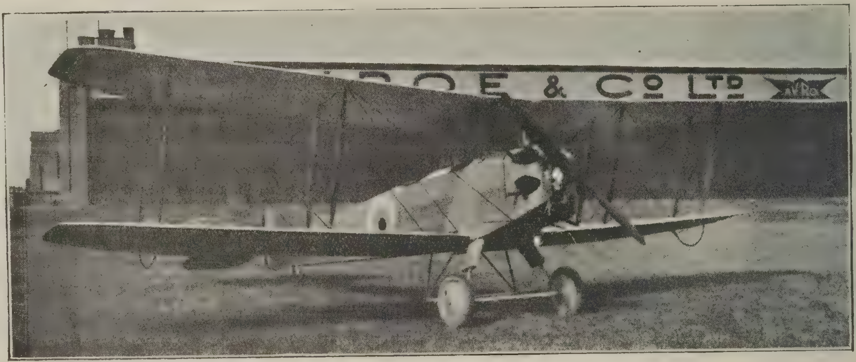

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ON IMPROVING THE BREED.

At various times since the Navy of the United States acquired the Schneider International Seaplane Trophy at Cowes in September last and since the Army of the United States raised the World's Speed Record for aeroplanes to the eminent figure of 266.58 miles per hour on Nov. 4 last, we have been treated to excusatory lamentations pretending to explain why we in this country cannot hope to defeat the Americans in future speed races. The argument has been almost unanimously that it is impossible for private enterprise to compete with lavish Government expenditure. It would now appear that there are some who think otherwise.

On Saturday, Feb. 23, Mr. C. R. Fairey, Managing Director of the Fairey Aviation Co. Ltd., and Chairman of the Society of British Aircraft Constructors arrived in England bringing with him, as it were in a suit-case, a complete Curtiss D.12 aero-engine of the type used in the aeroplanes which won the Schneider Trophy and the Pulitzer Trophy and beat the World's Speed Record. With it he brought agreements, entitling him to manufacturing rights in all Curtiss inventions, patents and designs. These include the famous wing radiators, which in themselves are worth several miles an hour to any high-speed aeroplane.

Mr. Fairey's argument is that if we are to beat the Americans and regain our international prestige the best way to do it is to use American brains as well as our own. The performance of an aeroplane depends on diminishing to the utmost weight per horse-power and head resistance. The Curtiss engine apparently weighs less and has less frontal area for its power than any other engine. The wing radiators reduce head resistance and weight still further. Therefore let us follow American practice and combine with it our own manufacturing experience.—Such in effect is the line of reasoning, and one must confess that it seems sound.

There are doubtless those who regret that we have not produced engines of similar characteristics in this country. Some will blame the Government, or the Air Ministry, for not providing the money for experimental work which would have produced such engines. Others will blame our engine manufacturers for not having spent their war-profits on producing such engines. Others again will blame our engine designers for not having arrived at the point reached by the Curtiss designers before the Americans reached it.

Doubtless also there are those who will argue that our good British engines which have passed the Air Ministry's searching type-tests are likely to be more reliable for the work of the Air Force than are American engines designed for pure speed. To such ultra-patriots one would only advise as a warning that they study the conditions of the type-tests of the U.S. Army Air Service, which have been passed by these engines and are said to be more severe than are our tests.

Others again may argue that it is unpatriotic to spend money on foreign designs and inventions when a similar amount of money spent at home would achieve the same results. Here the answer seems fairly simple. One has no idea what it has cost to buy these American inventions, but the cost of the single engine is probably known to most British aircraft makers—at any rate one imagines that any who are at all enterprising have obtained quotations from all foreign engine makers. And beyond the cost of the engine one assumes that payment will be by results in the form of royalties.

If that be so then we in this country shall get all the good that is possible out of the vast sums which have been spent by the U.S. Army and Navy in developing these engines and other designs and we shall only pay for that good as we feel the benefit of it. Which is payment by results in the best possible form.

Furthermore it is well to remember that this particular engine, the D.12, is rather in a class by itself. It is essentially an engine for a small high-speed machine, either a single-seater fighter or scout, or a two-seater fighter. According to present Air Ministry ideas its 500 h.p. is not enough for bombs or fleet-spotters or long-range reconnaissance machines—though personally one believes that it should be quite sufficient if the Air Ministry technicians would leave our designers a free hand.

For heavier and bigger aircraft we have our engines of 700 h.p. or 1,000 h.p., in which class we appear to be unsurpassed by any other country. And if in time the Air Ministry learns to leave our designers alone to do their best then we shall get aeroplanes which will have a longer range and will carry a bigger load with these same big engines.

In the meantime the Air Force needs high-speed single-seaters and two-seaters and has not got them. The U.S. Army has its machines which do between 150 and 200 miles an hour with guns and ammunition. The French Army has its new Nieuport single-seaters which do 160 miles an hour or more—which means that in due course the Russian Army will have the same type. The Dutch can get 160 miles an hour out of the new Koolhoven two-seater with a 400 h.p. British Bristol Jupiter engine, *bien entendu*. And we, who held the undisputed command of the air from the middle of 1917 to the end of 1919 have not got a machine which with Service equipment can beat 150 miles an hour. In fact there is not a single squadron of the R.A.F. equipped with machines which will average 130 miles an hour.

The position seems to be very much what it must have been when sundry sportsmen brought home from the Crusades samples of the light Turkoman horses used by the Saracens. One can imagine the breeders of the English " great horse " which carried our mail-clad knights in battle or tourney—the Shire horse of to-day—holding up their hands in horror at this light-limbed narrow-barrelled freak and prophecying that it would never pass the tests to which it would be put. But the fact remains that the Saracen horse was put into production and helped to breed the strong reliable horses which carried our cavalry from the time of the Wars of the Roses to that of the Georges.

Then the importation of heavy German horses with the heavy Hannoverian nobility, or else the natural disinclination of the Englishman to move in front of the times, deteriorated the breed and we produced a straight-shouldered round-quartered horse something like a Suffolk Punch in that period to which Walpole referred as " when every gentleman wore a wig and every horse a crupper." Which was set right by the growth of horse-racing and hunting. More Turkoman horses were imported and some Arabs—there is still fierce argument as to the relationship of or the difference between the two—and the result is the English Thoroughbred as we know him to-day, the World's best horse (except apparently when he goes to America to race).

The Shire horse and the Clydesdale and the Suffolk Punch is each in his way as useful as ever he was. The heavy gunner of 1914-18 loved his " hairies " as dearly as ever any cavalryman loved his English thoroughbred or his Australian Waler. But each has his own job to do.

And similarly each type of aero-engine will find its own special job so long as its design keeps pace with the needs of the times. But designers, whether of aeroplanes or engines, must realise that if they do not keep pace with the times their firms will lose orders and they will lose their jobs, and that the best thing is to keep just a little in front of the fashion instead of just behind it.

It was certainly a bold stroke for the Chairman of the S.B.A.C. to go to America for new ideas in the design of aeroplanes and engines. And one does not imagine that it will increase his popularity among some members of his Society. But Mr. Fairey has ever been ready to back his opinions, and in the vast majority of cases he has backed winners. One hopes that this latest venture will eventually benefit the whole Aircraft Industry as it should do.

At any rate the mere shock should stir up some people who seem inclined to rest on their reputations. M. Blériot boldly went to Austria for a designer a year or two ago, though the news has only recently become known. Beardmores of Glasgow have gone to Germany for fresh ideas. Now Mr. Fairey has boldly fetched complete designs from America. Perhaps it might be worth while for some of our other manufacturers to see what can be found among the Czecho-Slovaks and Lithuanians, who have already produced interesting machines.

English industry of all kinds has been built up by acquiring and adapting the best foreign ideas and methods. And it is to be hoped that the Aircraft Industry will follow in the footsteps of the other trades which have made England great by their acquisitiveness.—C. G. G.

THE WEST FRONT IN THE NEXT WAR.—II.

By C. G. GREY.

The General Line.

At the end of the first section of this article one expressed the opinion that the actual fighting front in the war against the people East of Warsaw would extend roughly from Dantzig to Switzerland in the North and from Switzerland to the Adriatic in the South.

It would seem to be a special dispensation of Providence that Switzerland should have been placed where it is. No army can possibly penetrate into Western Europe through Switzerland from the East. Any attempt to do so can be stopped quite easily by the small but highly efficient Swiss Army aided by the local inhabitants. The passes can be blocked by a few hundred men against as many hundreds of thousands.

Therefore if the Teutonic or Nordic nations hold the Northern line and the Latins or Mediterraneans hold the Southern line it will be possible for the Germans and French to fight on the same side against the Eastern Barbarians though not fighting side by side. Which will be a very convenient arrangement, for though the General Staffs of the Teutonic and Latin armies would co-operate amicably—as did the English and French and Italian staffs in 1914-18—it might be difficult to prevent fighting between the lower ranks of officers as well as among the men.

So far as the English and German armies are concerned there is not likely to be much trouble. Our Army of Occupation on the Rhine has existed for several years on quite friendly terms with the Germans, whether officials or civilians, and there have been no complaints from the people of occupied districts as there have been from those occupied by the French. Which will make things much easier when our men have to fight side by side with German troops. And our officers seem to regard such co-operation as being quite natural.

Only a few months after the Armistice of 1918 one happened to be discussing this subject with a very experienced soldier who had done well in the war and one asked him how he would like to command a mixed division of English and German troops in the next war. He replied that it would be splendid for the Germans were excellent fighting men, "And," he added jestingly, "it would be so convenient, for the Germans could commit all the necessary atrocities and we should take all the credit for the victories."—A piece of English humour which may not perhaps appeal to our future allies.

It seems probable that the Germans and English will have to hold the Northern line themselves with the aid of Dutch and Danish troops. We may have some Americans if the United States can spare any. But it is quite likely that a goodly army of Americans will be operating in the East Indies against Japan. And American troops will also be busy in Siberia, partly against the Japanese who are already settled there and in Manchuria, but more particularly to disturb communication between Japan and Russia along the trans-Siberian railway and to draw Russian troops Eastward so as to relieve the pressure on the West Front.

The Importance of Scandinavia.

The Swedish and Norwegian Armies and Navies and Air Forces will have their work cut out to prevent the Russians from occupying the Scandinavian peninsular and the Baltic. And it seems likely that we shall have to supply detachments of all three Services to help the Scandinavians.

It will be evident to the most elementary student of strategy that Sweden and Norway would make ideal jumping-off places for air raids on Germany and England. And the Swedes at any rate realise the fact. Throughout the War 1914-18 we used to regard the Swedes as being pro-German. As a matter-of-fact they were not. They were violently anti-Russian, and very rightly so. Consequently Englishmen in Sweden, as the allies of Russia, were regarded as enemies. And Germans in Sweden, as enemies of Russia, were regarded as friends.

It has been Russia's ambition for generations to make the Baltic a Russian lake by conquering Sweden as she conquered the other non-Muscovite Baltic States, Finland, Lithuania, Esthonia and Latvia. And as soon as re-organised Russia starts her new career of conquest the Baltic States will be absorbed again, very much as Napoleon Bonaparte absorbed Saxony and Wurtemburg before he attacked Prussia and Austria. Therefore as soon as the trouble begins Sweden will concentrate all her strength on her frontier and coast opposite Russia.

If we act promptly we can send enough air force to Sweden to make it possible, with the aid of the small but very good Swedish Air Force, to bomb Petersburg (or Petrograd or Leningrad) and Kronstadt and any other Baltic ports which may be in the hands of the Russians. And we can torpedo or bomb all Russian ships in the Baltic and so prevent any interruption of our sea communications with Sweden. And we can prevent Russian air force from bombing Swedish towns and shipping.

But if we follow our usual precedent as in the case of Belgium and Servia in 1914, we shall let Russia invade Sweden without hindrance. And brave as the Swedes are they are bound to be submerged by sheer weight of numbers. Then the Russians will be able to occupy the Northern shore of the Baltic and from it their aircraft will be able to reach the chief towns of Northern Germany, Denmark and Holland. After which, by occupying Southern Norway, the Russians will be able to despatch air raids across the North Sea to Scotland and Eastern England. So much at any rate is possible with ordinary modern long-range bombers.

There is no need to try to scare the un-informed with yarns about aircraft with a range of 1,000 miles, and a capacity for carrying high-explosive and poison-gas bombs capable of wiping out London in a night. Such stories do more harm than good, for those who know the facts merely laugh at them and so encourage unbelievers in their disbelief. The plain facts are that if the Russians occupy the South coasts of Sweden and Norway at the start of the next war, as the Germans occupied Belgium and Servia in 1914, they will be able to make things very unpleasant for us in England.

Home Defence.

Now this is precisely where the question of Home Defence arises. Throughout the whole debate in the House of Commons on Feb. 19, when the Air Force was first discussed under a Labour Government, everybody agreed that we must have adequate air strength to defend us against attack from the air. Even convinced pacifists like our new Under-Secretary for Air, Mr. William Leach, admitted that the policy of the Baldwin Cabinet as laid down by Sir Samuel Hoare must be carried to the completion of its first stage and that the Royal Air Force must be expanded to 600 first-line aeroplanes. But everybody, militarists and pacifists alike, insisted on taking the French Air Service as our standard and regarding France as our possible enemy.

Sir Samuel Hoare's motion called for "sufficient strength to give adequate protection against air attack by the strongest air force within striking distance." And obviously the French Air Service *is* the strongest within striking distance.

Regarded purely academically the French Service is a useful standard to adopt. For if we build aeroplanes up to the French standard of quantity and then proceed to man and maintain those machines up to the English standard of quality we shall be prepared quite comfortably on a Two-Power basis to tackle anything that may happen. And perhaps after all it is as well to let the Great British Public think for the time being that we are only concerned with protecting our home towns against attack from France. It would be trying the Man-in-the-Street rather high to ask him to understand the problems of defending England against attacks by Russian aircraft from Scandinavia. But in this article we can afford to go more deeply into the subject.

Russian Intentions.

First and foremost there is the question of Russian intentions. There are many who profess to know Russia well who will argue that the Russian is not by nature aggressive. That may be so. But it is acknowledged by all soldiers that the Russian-Muscovite infantry when properly led are equal to the finest in the World, especially in defence, and that Russian-Tartar cavalry are extremely good in attack. And the very fact that individually the Muscovite is inclined to be sheep-like and not aggressive makes him the better soldier under discipline and the easier for a Russian Napoleon to turn into cannon-fodder.

What the Russian proletariat think about war is of no account. What does matter is what the Chiefs of the Red Army think, and their ideas are not sufficiently known in this country, chiefly because of the monumental stupidity of the people who mismanage our daily newspapers.

Many people in Germany know what are Russia's intentions. And some few people in this country know. Still fewer people know that so far as foreign policy is concerned there is no difference between the Russian Imperial Government and the Soviet Government. That policy is one of conquest and expansion—Soviet officials in Persia are operating exactly as Czarist officials acted, as the *Morning Post* demonstrated recently. Soviet troops in Bokhara have acted exactly as Czarist troops acted in Turkestan and in Mongolia a few years before the War 1914-18.

Very few people recognise the fact that the root cause of the War 1914-18 was that Russia was building a vast network of strategic railways along the German and Austrian

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frontiers and that Russia had to be smashed before the completion of those railways made an invasion of Germany possible. —Germany's war against France would only have been an incidental campaign to cover Germany's West flank if England had not butted in and made France the main war area. And to-day Soviet Russia is just as much intent on driving a road into civilised Europe as ever was Imperial Russia.

The Russian Objective.

A highly intelligent Western European who has recently been in Moscow has many illuminating facts to tell about the intentions of the Red Army. He associated freely with the officers and found that they were all waiting for the advent of the great soldier who is to lead them Westward. In fact one rather brilliant young cavalryman spoke openly of his intention to become the Russian Napoleon.

Ostensibly the Soviet Army exists to defend democracy against the attacks (military or political) of the Western Bourgeoisies. But the Russian soldier like any other soldier knows that the best form of defence is attack. And the intention of the Red Army is to attack the Western Bourgeoisies as the best form of defence.

Most of the officers served in the Imperial Army, but being professional soldiers they naturally serve where they can. The Red Army being the biggest in the World there is naturally more opportunity for them there than anywhere else. And, as in the case of the officers of the armies of the French Revolutionary Governments, a man will as a rule serve a republican government in his own country rather than a royalist government in a foreign country. Moreover, under a Red revolutionary government the officers of the army very soon become a privileged class and form a military aristocracy which may have to fight at times but in other respects replaces the old leisured class. So naturally the Red Army is popular among the young and enterprising and ambitious.

The Western European already quoted says that the officers of the Red Army discuss as a matter of course an invasion of Western Europe, which they regard as a promenade through a broken and disarmed Germany with Paris (the city of champagne and women) as their ultimate objective. When he asked them how they proposed to get there they replied, "On our feet. We walked to Paris in 1812-13 and 14, and we can walk there again."

So there in the fewest possible words is a summary of Russia's intentions. They may not be the intentions of the Triumvirate which at the moment controls Russia. They may not be the intentions of Trotski, the Tartar chief of the Red Army. But they *are* the intentions of the Army itself. And when a Government is carried by the army it has to go whither the Army chooses to carry it.

The Red Army is at present waiting for several things. It is waiting for artillery, for mechanical transport and for aircraft. And it is waiting for its Napoleon. But it is steadily acquiring its mechanical equipment. And the hour will find the man. When the man is found we in Western Europe will need to pay special and urgent attention to matters of Home Defence.

(To be continued.)

Air Defence.

It is announced officially that Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., has been appointed General Officer Commanding Territorial Army Air Defence Brigades and Inspector of Regular Army Anti-Aircraft Units.

It is stated that Colonel C. W. Collingwood, C.M.G., D.S.O., has been appointed to be Brigade Commander, 1st Air Defence Brigade, vice Major-General Ashmore.

All who were concerned with the old R.F.C or with the London Air Defence Area during the War 1914-18 will be glad to see that General Ashmore's excellent work has been recognised. There is certainly no officer of his seniority who combines such knowledge of artillery and aircraft.

His career as a soldier has fitted him peculiarly for his present post. At Woolwich he was regarded as brilliant. On leaving the "Shop" he devoted himself to sport and then after a period went to the Staff College out of which he passed with what were, one believes, record marks. He joined the R.F.C. soon after that corps was formed and during the War commanded a brigade in France with great success, both professional and personal.

In 1917, when German air raids became really troublesome, General Ashmore was appointed to organise the London Air Defence Area, which he did with such success that after an attack in May 1918 which did little damage to London and caused the loss of many raiding machines the Germans gave up raiding London.

Since December 1920 he has commanded the 1st Air Defence Brigade at Aldershot. His new appointment makes him in effect General Officer Commanding all ground defences against aircraft. And when it is recognised that the Naval maxim "A gun ashore is worth two in a ship" applies with still greater force to anti-aircraft defences it may be seen that the command is one of very considerable importance in the making of history.

The 1924 Light Aeroplane Competition.

The rules and regulations governing the competition for the Air Ministry prizes of a total of £3,000 have just been issued by the Royal Aero Club. The essential features are as follows:—

The competition is for two-seater aeroplanes provided with an engine of a piston displacement not exceeding 1,100 c.c. The machine must be fitted with dual control, and with an air-speed indicator visible from both seats. Including engine and magneto the machine must be entirely designed and manufactured in the British Empire. The competition will be held during September at a place to be announced.

Machines will be required to carry a load of 340 lbs. exclusive of fuel during all flights in the competition. In test B (demonstration of dual control) both pilot and passenger must be carried. In other tests the carriage of a passenger is optional, but if no passenger be carried 170 lbs. must be carried in each seat—with the exception that if the pilot weighs more than 170 lbs. the load in the passenger's seat need not be more than is necessary to make up a total of 340 lbs.

Competitors must comply with the Air Navigation Regulations in force at the time, subject to any concessions which the Air Ministry may make for the occasion. Certificates of Airworthiness in the "Normal" category ar compulsory. This requirement is qualified by the somewhat cryptic remark that the Air Ministry "will not require to be supplied with drawings." Certificates of Airworthiness will not be required for the engines.

All machines will be required to pass eliminating tests before proceeding to the Competition proper. These tests consist of (A) a dismantling, housing and re-erecting test, and (B) a demonstration of the dual control. For (A) the machine fully erected must be dismantled or folded so that it may be transported not more than 25 yards and placed in a shed 10 ft. wide. It is then to be taken out and re-erected. Two persons only will be allowed to handle the machine in this test, which must not occupy more than two hours. For (B) two separate flights—each of one lap of the course—followed by a figure of eight are to be made. Between the flights the pilot and passenger are to change seats.

In order to be eligible for any of the prizes offered at least 10 hours' flying must be completed during the period of the competition.

The Air Ministry prizes will be awarded on the total of marks gained for speed range, getting off, and pulling up, £2,000 for the highest and £1,000 for the next highest aggregate.

The high speed will be determined in two separate flights, each of about 75 miles over a course. An interval will be allowed between these flights for taking in fuel and oil only. The low speed will be taken by timing up and down a straight course of not less than 500 yards. No marks will be awarded unless the high speed exceeds 60 m.p.h. or if the low speed exceeds 45 m.p.h. The difference between high and low speed will then be expressed as a percentage of the low speed. No marks will be awarded for a speed range less than 33⅓ per cent. of the low speed and eight marks will be given for each one per cent of speed range in excess of 33⅓ per cent.

The "Getting off" test will consist of a take off from rest and flying straight over a barrier 25 ft. high, the pilot choosing the distance from which to start. One mark will be awarded for every yard by which the distance of a successful start is less than 450 yards.

In the "pulling up" test a straight landing has to be made over a barrier six feet high. One mark will be awarded for each yard by which the distance from the centre of the barrier to the stopping point of the aeroplane is less than 150 yards.

In addition a first prize of £500 given by the Duke of Sutherland, and a second prize of £100 given by Capt. C. B. Wilson, M.C., will be awarded for the machine gaining the greatest and the second greatest aggregate marks in the "getting off" and "pulling-up" tests.

The entry fee is £20 for each machine up to Aug. 1. Late entries at a fee of £40 will be received up to noon on Aug. 15.

It is announced by the Royal Aero Club that the Duke of Sutherland has expressed his intention of purchasing a two-seater light aeroplane of a type evolved from the machines taking part in this competition for his own use. This machine will not necessarily be of the same design as the machine which wins the competition as a whole.

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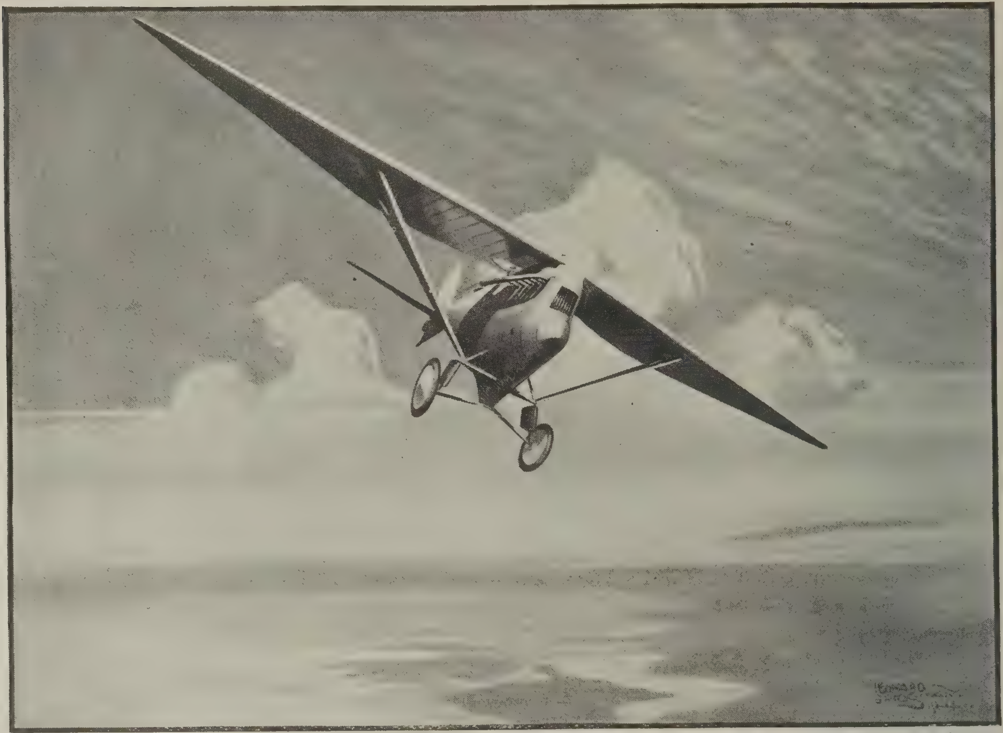

A LITHUANIAN FIGHTER.—An impression by Mr. Leonard Bridgman of the Dobkevicius D.2 two-seater reconnaissance fighter (200 h.p. Benz engine), designed by Lieut G. Dobkevicius, technical officer of the Lithuanian Air Force. The D.2 possesses an excellent all-round performance, showing, in official tests, a top speed of 155 m.p.h., a low speed of 50.6 m.p.h., a climb of 22,960 feet in 34 mins., and a ceiling of 29,520 feet.

The Royal Aeronautical Society.

The annual General Meeting of the Royal Aeronautical Society will be held on Thursday, March 7, 1924, at 5.0 p.m. at the offices of the Society, 7, Albemarle Street, London, W.1. The business before the meeting will be :—

(i) To approve the Report of the Council and the Balance Sheet of the Society.

(ii) To discuss and determine such questions as may be raised referring to the business of the Society, provided that notice in writing of the proposal to discuss any such question shall have been received by the Secretary not later than noon on Mar. 13 next.

(iii) To fill the vacancies on the Council caused by the retirement of Brig-General R. W. Bagnall-Wild, Mr. Griffith Brewer, Mr. H. P. Folland, Squadron Leader R. M. Hill, Mr. C. F. Jenkin, Prof. B. Melvill Jones, Mr. J. D. North, Lt.-Col. A. Ogilvie, Dr. A S. Sutton-Pippard and Major H. E. Wimperis.

Nominations for these vacancies each signed by two and not more than two members eligible to vote must be received by the Secretary not later than noon Mar. 6 and must be accompanied by an intimation from the nominees that they are willing to serve. Retiring members of the Council are eligible for re-election.

Presumably for the guidance of those who are concerned in the matter there is appended to the official notice of this meeting a list showing the attendances at Council meetings of the members of the Council for 1923/24. Ten such meetings have been held and the following list gives the attendance of the various members :—

Brig-Gen. Bagnall-Wild, 0; Prof. Bairstow, 6; Mr. Griffith Brewer, 7; Wing Commander Cave-Brown-Cave, 2; Sir Mackenzie Chalmers, 9; Mr. C. R. Fairey, 4; Mr. H. P. Folland, 0; Prof. C. F. Jenkin, 4; Prof. Melvill Jones, 1; Lt.-Col. Moore-Brabazon, 1; Mr. J. D. North, 2; Lt.-Col. A. Ogilvie, 8; Lt.-Col. M. O'Gorman, 6; Dr. Sutton Pippard, 0; Mr. J. L. Pritchard, 5; Col. The Master of Sempill, 8; Major R. V. Southwell, 5; Lt.-Col. H. T. Tizard, 3; Major H. E. Wimperis, 5.

It may be noted in passing that this information does not seem to give any very clear guidance as to who among the retiring members of Council deserve best of the Society. As a mere interested looker-on one might incline to advise members who wish to see a revival of interest in the proceedings of the Society to choose for re-election rather those who have not been particularly assiduous in attendance than those who have, were it not for the fact that such a course would be distinctly unfair to one or two really valuable members of the Council who have attended frequently.

On the whole therefore one would suggest that attendance at Council meetings should not be considered unduly. It may be suggested that the Royal Aeronautical Society will stand to lose little if the influence in its Council of those who represent the official and academic interests in aeronautics were somewhat reduced.

The Diving D.H.

It is understood that the tests designed to discover the swimworthiness of the D.H.18 are to be carried out at Felixstowe and that an air Ministry test pilot is to do the deed.

It has been suggested that real live passengers should be placed in the cabin and the time which they take severally and collectively to emerge should be taken. All sorts of groups of people have been suggested as the passengers, such as the Air Council, the Committee of the Royal Aero Club, the B.B.C. Uncles, and the directorate of the Imperial Air Transport Co.

Turning Over a Page.

It is reported from Ipswich that a monoplane known locally as the Yanky-Panky met with a slight mishap at Martlesham Heath recently. When alighting after a speed test the undercarriage collapsed owing to the fact that a fitting gave way and the machine stood somewhat violently on its nose. The pilot was unhurt though the machine was damaged so seriously that it was brought back to North London on a lorry. It is now being repaired.

Brighter Aircraft.

It is understood that aircraft firms are now using the names of well-known " newspaper pets " after which to christen their new types of aeroplanes and engines.

The first of these is to be the Fairey Felix, which is, one believes, to be the cognomen of the British-built Curtiss D.12 engine, as its type brings it into the " feline " class of names along with the Tiger, Lion, Puma, Cub, and so forth. One hopes that this will enable machines to take off quickly and will not, like its namesake, " keep on walking."

We may expect to hear soon of the Parnall Pip, the Short Squeak, and the Westland Wilfred, the last of which would no doubt be useful on a long flight round the globe.

And then why not have the Boulton and Paul Bewsher? There are many possibilities in such a machine for bombing Bruges in the true poetic manner.

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Saturday Review, 1/9/23.

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A British Pilot Abroad.

Mr. Frank Courtney has recently been over in Holland completing the tests of the Koolhoven monoplane (the "Kullybus," as it is nicknamed). Mr. Courtney speaks very highly of this machine now that it has had the necessary modifications made.

Mr. Courtney has now left for Sweden and is going up to the Arctic Circle to carry out some test work there.

The Air Union's Plans.

Now that the Air Union is no longer unified, because the Farman interests are in future to operate the Paris-Brussels route and the Bleriot-Breguet-Caudron interests are to exploit the Paris-London route, there is likely to be a change of policy.

For the time being at any rate Farman Goliaths are still to be used on the London-Paris route but during this year two new machines are to be tried. One of these is to be a limousine version of the Breguet type XIX sesquiplane. The machine will carry five passengers. The make and type of the second machine will be announced shortly.

The policy of the Air Union is to follow closely that which has been advocated frequently in The Aeroplane. Instead of despatching one or two big machines every day, these small five-seaters will be despatched at frequent intervals and it is hoped eventually that one machine per hour or if necessary more frequently still will leave both Paris and London. Thus anyone will be able to go down to Croydon at any time between dawn and dusk and be certain that, weather and organisation permitting, they will not have to wait more than an hour for a machine to Paris.

The French Engine Competition.

The competition for French aero-engines promoted by the Comité Français de Propagande Aéronautique began on Monday with preliminary tests of eight engines at Chalais-Meudon.

The first test is a two-hours' flight driving a single-engined aeroplane. An altitude of 3,500 ft. must be maintained for at least one hour.

The endurance test will take place in three months' time and will take the form of a 240-hour run in eight-hour laps.

The following are the engines entered:—One 400 h.p., 12-cylinder Farman; two 400 h.p. 12-cylinder Renaults; one 420 h.p. 18-cylinder Salmson; one 450 h.p. 12-cylinder Panhard-Levassor; two 420 h.p. 12-cylinder Breguets; one 450 h.p. 12-cylinder Lorraine-Dietrich.

It is thought that with the facilities offered at Chalais-Meudon for such tests the results may be expected at any moment within the next decade after the end of 1925 by which time the tests may perhaps be completed.

The only engine of "foreign" design and construction entered for the French Engine Competition, the Fiat, has been withdrawn.

Under the rules of the French competition the engines have to be tested on the bench at practically sea-level and not in the rarified atmosphere in which they will work normally. The Fiat engine, of which a supercharger is an integral part, has been withdrawn because it has been decided that in order to allow it to compete on equal terms with the French engines, modifications eliminating the supercharger would have to be made.

It was quite clear when the regulations were issued the tests would be done at ordinary atmospheric pressure so that it would appear that the Fiat entry was made under a misapprehension.

The Fiat aero-engine has doubtless been derived from the wonderful little Fiat racing engines which won the Grand Prix d'Automobiles in France in 1923. It is understood that that Fiat supercharger aviation engine will take part in the Endurance Trials to be held in a few months' time by the Italian Government.

A New Air Service to North Africa.

The opening of a new air service between Alicante and Oran has been officially announced. A daily service will be run in each direction, and seaplanes will be used which carry three passengers. The machines will leave the termini at 7 a.m. Passengers will be able to continue their journey if they desire from Alicante to Toulouse and Marseilles by the services which either exist already or those which are about to start.

The Loss of the Dixmude.

The Ministry of Marine has received a dispatch from the French Naval Attaché in Rome stating that fishermen belonging to Sciacca in Sicily have discovered a large number of objects which seems to indicate that the wreck of the Dixmude lies somewhere in the vicinity.

Among the objects picked up are some wireless gear, a parachute, a pocket lamp, a leather helmet, an aluminium flask, a French flag and a pocket book, visiting cards with the name of "Pueche" and a copy of the Admiralty Order dated Oct. 20 last congratulating the crew of the Dixmude.

New Danish Air Services.

The Danish Government have decided to grant a subsidy of 170,000 kroner (£6,000) for a daily service between Copenhagen and Hamburg and Rotterdam. After the arrival of the express trains bringing passengers from Stockholm and Christiania an aeroplane will leave for Rotterdam which it should reach by 3.30, thus allowing passengers to connect with the Daimler service to London. It will thus be possible to complete the Copenhagen-London service in ten hours.

An aeroplane capable of carrying five passengers and mails at present leaves Rotterdam for Copenhagen every morning.

Holland to the Dutch East Indies

Nothing has yet been decided definitely with regard to the flight of Mr. Van de Hoop from Holland to the Dutch East Indies. The Dutch Government wish for the flight to take place on an ordinary commercial machine so as to demonstrate the quality of Dutch commercial aircraft. The flight was originally to have been made on the Fokker monoplane with a Rolls-Royce engine with which tests were made at Schiphol last year. This machine has not had the success which was expected for it and a new version of the machine has now been produced.

Mr. Van de Hoop personally would like to undertake the flight on the Fokker T.3 on which type Commander Saccadura Cabral is to attempt to fly round the World and it seems that it would be the best plan to allow him to make the flight on this machine instead of putting it off continually until a commercial machine capable of making the flight has been perfected.

Prague as an Air Centre.

The following letter has been received from a pilot of long and wide experience:—

> The statement in The Aeroplane of Feb 27 rather interests me. It has been long the aim of the Czecho-Slovaks to make Prague an Air Terminus and the French also look favourably upon this. I know this territory well as I was sent out there by the Aircraft Manufacturing Company and A.T. & T. as their representative in 1919-20, and carried out negotiations with some of the Central European Governments.
>
> As a result of constant touring both by motor-car and by train, boat, etc., I was forced to the conclusion that Prague never could become an air centre. The weather in that part of Czecho-Slovakia is against it. To the North, East and West of Prague the country is mountainous. Snow and fog low on the mountains during the winter make flying almost impossible. Karlsbad and Marienbad are weather-bound.
>
> The only real terminus for that part of Central Europe will be Bratislava, in the valley of the Danube. The climate is excellent at Bratislava, the air is clear, and in the summer it is warm and sunny. Also the land is flat and there is room and plenty for forced landings.
>
> The town too has a "terminal" name. It is called Bratislava by the Czechs, Pozsony by the Hungarians, and Pressbourg by the Austrians. It is the ideal centre for Czecho-Slovakia, Austria, Yugo-Slavia, Hungary and Roumania.
>
> Prague is isolated—by air—from its Northern neighbours in all but the best months. Southern Germany could be reached in winter time from Prague via Bratislava and Vienna.

The Argentine World-Navigators.

The Argentine aviators, Major Pedro Zanni of the Argentine Army and Lieut. Nelson Page of the Argentine Navy, who intend to fly round the World, did The Aeroplane the honour of visiting this office on Monday last accompanied by Lieut. Col. Ruiz the Argentine Military Attaché in London. Major Zanni and Lieut. Page are visiting the various aircraft factories in this country with the intention of learning as much as possible of British aircraft design and construction, and it may be that they will ultimately decide on a British machine for their World tour.

The rumour has gone forth that the Argentine World-flight had been cancelled owing to the death of Major Zanni in an aeroplane accident. This error has arisen owing to the death of Major Zanni's brother, an officer of the Argentine Navy, in an accident to a Dornier flying-boat in Italy some few months ago. Major Zanni is happily alive and well, and is determined for the honour of Argentine aviation to make a sporting effort to get round the World by air in competition with the highly organised schemes of the United States Naval Air Service and of Squadron Leader Maclaren of the Royal Air Force.

Major Zanni is an excellent example of the Latin aviator. Evidently a man of great determination and will-power he has also imagination and vision such as inspired the great Italian, Spanish and Portuguese navigators of the Middle Ages on their long voyages. Lieut. Page who is of English descent is the navigator by reason of his Naval training. And curiously enough while Major Zanni speaks excellent English Lieut. Page does not speak English at all.

One wishes every good fortune to this sporting Argentine effort and one bespeaks for Major Zanni and Lieut. Page a hearty welcome wherever they may encounter readers of The Aeroplane all over the World. The compatriots of the men who flew over the Andes from the Argentine to Chile on the curious old aeroplanes of the days before the War 1914-18 will certainly make a gallant attempt at circumnavigating the World by air.

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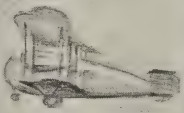

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THE ROYAL AIR FORCE.

Appointments.

Week ending Mar. 3.

GENERAL DUTIES BRANCH.—Wing Commander W. L. Welsh, D.S.C., A.F.C., to H.M.S. "Eagle," to command R.A.F. Unit, 26/2.

Squadron Leaders E. R. Pretyman, A.F.C., to H.M.S. "Eagle," 26/2; A. J. Currie, to Aircraft Depot, Egypt, 1/2; D. Iron, O.B.E., to R.A.F. Depot on transfer to Home Estab., 20/2.

Flight Lieutenants C. A Stevens, M.C., to remain at No. 1 School of T.T. (Boys), Halton; C. L. King, M.C., D.F.C., to No. 4 Sqdn., S. Farnborough, 25/2; C. R Richardson, to R.A.F. Depot, 7/3; D. K Cameron, to H.M.S. "Eagle," 26/2.

Flg. Offs. B. I. Carter and H. W Beck, to H.M.S. "Eagle," 26/2; G. D. B. Russell, to School of Army Co-operation, Old Sarum, on transfer to Home Estab., 30/3; D. G. Brodie, to Signal Co-operation Flight, Kenley, on transfer to Home Estab., 18/3; B. G. Pool, to No. 207, Sqdn., Eastchurch, 4/3; C. S. Whellock, to No. 14 Sqdn., Palestine, 20/2; H. J. Brown, to No. 5 Sqdn., India, 21/1; A. C. Tremellen, to R.A.F. Depot on appointment to a S.S. Commn., 26/2; F. W. Sinclair, D.F.C., to No. 4 Sqdn., S. Farnborough, 5/2; C L. Lowe, D.F C., to Aeroplane Exper. Estab., Martlesham Heath, 15/3.

MEDICAL BRANCH.—Squadron Leader (Medical) A. E. Panter, B.A., to School of T.T. (Men), Manston, 6/3. Flight Lieutenants (Medical) W. F. Wilson, M.C., M.B., to No. 5 F.T.S., Shotwick, 16/3; C. T. O'Neill, O.B.E., M.B, to R.A.F. Central Hospital, Finchley, 14/3; J F. Gallagher, to R.A.F. Depot, 12/3; A. E. Henton, to No. 41 Sqdn., Northolt, 25/2; J. T. T. Forbes, to No. 4 F.T.S., Egypt, 14/2. Flight Lieutenant (Dental) C. T. Hastings, to Palestine General Hospital on appointment to a Temporary Commn. on attachment from the Army, 1/2. Flying Officer (Medical) R. H. Stanbridge, to Research Laboratory and M.O.S. of I., Hampstead, on appointment to a S.S. Commn. for short course, 19/2.

STORE AND ACCOUNTANT BRANCH.—Squadron Leader (Stores) F. H. Songhurst, M.B.E., to R.A.F. Depot, on transfer to Home Estab., 7/2. Squadron Leader (Accountant) J Rylands, to R.A.F. Depot on transfer to Home Estab., 8/2. Flying Officers (Stores) F. A. Ormerod, to No. 1 School of T.T. (Boys), Halton, 10/3; W A. Kyte, to School of Naval Co-operation, Lee-on-Solent, 1/3; H. B. Hawker, to No. 11 Sqdn., Bircham Newton, on transfer to Home Estab., 1/3; W. B. Frederick, to School of T.T. (Men), Manston, 6/3; J. G. Smithson, to H.M.S. "Eagle," 26/2.

London Gazette.

Feb. 29.

GENERAL DUTIES BRANCH.—Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., is placed on half-pay Scale A (March 1); Flt. Lt. R. F. L. Dickey, D.S.C., is placed on half-pay, Scale B (Jan. 24) (substituted for notification in *Gazette* of Feb. 15).

Air Ministry, Feb. 26.

GENERAL DUTIES BRANCH.—The follg. Plt. Offs. are promoted to the rank of Flg. Off. (Feb 16) :—L. K. Barnes, W. L. Dawson, C. H. A. Stevens, C. B. R. Pelly, S. G. Connolly, G. H. Huxham, D. L. G. Bett, C. B. B. Maturin, C. S. Riccard, E A Healy, E. B. Forster

Flt. Lt. R. H. Portal D.S.C., is granted the honorary rank of Squadron Leader on promotion to the rank of Lt.-Cdr., R.N. (Feb. 15).

The follg. are placed on half-pay :—SCALE A.—Grp. Capt. R. Gordon, C.B., C.M.G., D.S.O. (Feb. 16). SCALE B.—Flt. Lt. H. J. Edgar (Feb. 13).

Air Commodore C. R. Samson, C.M.G, D.S.O., A.F.C., is restored to full pay from half-pay (Feb. 26); Flg. Off. H. G. Sullivan relinquishes his S.S. Commn. on account of ill-health contracted in the service, and is permitted to retain his rank (Feb. 29); Flg. Off. C. Douglas relinquishes his S.S. Commn. on account of ill-health contracted in the service (Mar. 1).

RESERVE OF AIR FORCE OFFICERS.—The follg. officers are confirmed in rank with effect from the dates indicated :—FLG. OFFS.—B. S. Wilcox D.F.C. (Jan. 30); H. C. Cooke, H. D Davis, A.F.C., H. E. Duncan, and C. H. Howitt (Feb. 21). PLT. OFFS.—W. L. Woodward and W. R. Bannister (Jan. 30); W. A. Hammerton (Feb 21).

The Palestine Command.

The following appeared in the *Morning Post* on Feb. 28 and Feb. 29 :—

The Palestine Government announces officially, says the Jewish Telegraphic Agency, that Major-General Tudor has resigned the Military Command in Palestine. It is further stated that from April of this year the post of Military Commander in Palestine will be abolished. The British forces in the country will from that date be placed under the command of Air Commodore Gerrard.

Major-General (Temporary Air Vice-Marshal) Sir H. Hugh Tudor commanded the 9th Division in 1918, was Police Adviser in Ireland in 1920, and was appointed Director of Public Safety and G.O.C. Palestine in 1922.

[One may add that Air Commodore E. L. Gerrard, C.M.G. D.S.O., late R.M.L.I., was one of the first four officers under the Admiralty to learn to fly. As a Lieutenant of Marines he, together with Lieuts. Samson, Longmore and Gregory, R.N., were taught to fly by Mr. George Cockburn at the Royal Aero Club's ground at Eastchurch on Short biplanes lent by Mr. Frank McClean. He was one of the first R.N.A.S. officers to go overseas at the outbreak of war and he led a bomb-raid on Germany from Antwerp before the capture of that city. Later he served with distinction in the Mediterranean and elsewhere. Since the Armistice he has held commands in Ireland and at Kenley.—ED., THE AEROPLANE.]

The Dunning Memorial Cup.

The Dunning Memorial Cup, which is given annually to the officer who is considered to have done most to further aviation in connection with Fleet work, has been awarded to Flg. Off. Eustace Jack Linton Hope for 1923.

[Flg. Off. Linton Hope is one understands the son of the late Major Linton Hope famous as the designer firstly of racing yachts and later of the Linton Hope system of flying boat hull, one of the most successful types ever produced. Flg. Off. Linton Hope has evidently inherited his father's interest in the naval branch of aeronautics and has distinguished himself particularly in connection with the development of deck-flying.]

Air Affairs in Parliament.

AIR TRANSPORT COMPANIES

In the House of Commons on Feb. 25 MAJOR ROPNER asked the Prime Minister whether it is the intention of the Government to pay subsidies to air transport companies in the Colonies which are outside the scope of the Imperial Air Transport Company; and whether the Government will make grants to Colonial Governments to assist in the establishment of air lines in the Colonies. THE PRIME MINISTER said that at present there is no intention on the part of His Majesty's Government to pay subsidies to air transport companies in the Colonies or to make grants to Colonial Governments towards the support of Colonial air lines.

R.A.F., PALESTINE.

In the House of Commons on Feb. 25, in reply to a question by DR. SPERO, the UNDER-SECRETARY OF STATE FOR AIR (MR. LEACH) said that the total number of Air Force Personnel, all ranks, in Palestine is 646.

CIVIL AVIATION.

In a written answer to a question by MR. A. T. DAVIES on Feb. 26, the UNDER-SECRETARY OF STATE FOR AIR (MR. LEACH) said that the aggregate distance flown on subsidy-earning flights from Oct. 1 1922 when the present system was adopted, up to Jan. 31 last was 888,621 miles and the total amounts paid to each company to the same date were :—British Marine Air Navigation Co. Ltd., £3,846 3s. 4d.; Daimler Hire Ltd., £69,807 13s. 8d.; Handley Page Transport Ltd., £26,927 12s. 9d.; Instone Air Line Ltd., £39,775 3s 9d

No company has received the full subsidy when the number of miles stipulated by the Air Ministry has not been flown but in two cases subsidy payments have been suspended since the beginning of January last. The system of payment is that the Air Ministry issues each fortnight a sum equal to one twenty-sixth of the total subsidy for a yearly period or one thirteenth of that for a half-yearly period and makes at the end of the period in question the necessary adjustment to secure that the total amount paid is proportionate to the actual mileage flown. MR. LEACH said that he was not aware of any variation from the general rule but if the hon. Member would supply him with information he would cause inquiries to be made.

AIR DEFENCE

In a written answer to a question by SIR F. HALL on Feb. 26 the UNDER-SECRETARY OF STATE FOR AIR (MR. LEACH) said that 1,413 persons were killed and 3,407 injured by the action of enemy aircraft in this country during the War. The first line strength of the squadrons allotted to Home Defence at the time of the Armistice was 348 aeroplanes. The corresponding figure at the present time is 76 aeroplanes The machines at present in use are drawn almost entirely from the very extensive stocks which had been accumulated at the date of the Armistice and which have since been largely re-conditioned. Considerable orders for machines of new design have, however, recently been placed.

THE ROYAL AIR FORCE.

In the House of Commons on Feb. 28, in reply to a question by REAR-ADMIRAL SUETER, the UNDER-SECRETARY OF STATE FOR AIR (MR. LEACH) said that the Auxiliary Air Force Bill will be introduced at an early date.

Replying to LIEUT.-COMMANDER KENWORTHY on Feb. 28 the UNDER-SECRETARY OF STATE FOR AIR said that the total number of commissioned officers borne on the active list of the R.A F. is 3,136. This includes 657 officers of stores, accountant, medical and other non-flying branches and 160 ex-warrant officers of the R.N.A.S. There are 1,703 fully qualified pilots not including qualified pilots who are permanently unfit. All officers of or below the rank of Wing Commander who have qualified as pilots and are medically fit to fly carry out regular duty in the air sufficient to maintain them in constant flying practice.

CIVIL AVIATION

Replying to LIEUT.-COMMANDER KENWORTHY on Feb. 28 the UNDER-SECRETARY OF STATE FOR AIR said that the ratification of the temporary air traffic agreement between this country and Czecho-Slovakia has been forwarded to His Majesty's representative at Prague for exchange against a similar instrument to be executed by the President of the Czecho-Slovak Republic. The Air Service between London and Prague has not started on account of the action of the German Government in withholding their consent to the operation of the service over German territory.

LIEUT.-COMMANDER KENWORTHY and SIR H. BRITTAIN in supplementary questions asked the reason for the long delay. MR. LEACH explained that there are certain disabilities placed upon German aircraft developments and the Germans raise similar difficulties wherever possible to put upon other nations who want to fly over their territory.

EXPENDITURE (FRANCE).

On Feb. 28, in reply to a question by COMMANDER BELLAIRS, the UNDER-SECRETARY OF STATE FOR AIR said that the French Budget credits for 1924 are Army Aviation (including Colonial), 321,287,639 francs; Navy Aviation, 105,540,081 francs; Civil Aviation including subsidies, 138,463,350 francs In addition a portion of the provision for general services of the Army and Navy is to be attributed to the requirements of military and naval aviation.

THE AMERICAN WORLD FLIGHT.

Replying to a question by SIR H. BRITTAIN on Feb. 28 the UNDER-SECRETARY OF STATE FOR AIR said that the Air Ministry has received full information of the proposed World Flight and is in communication with the American Air authorities in regard to that part of the flight which will be over British territory. Four or five machines of the U.S. Army Air Service will take part in the flight which will be carried out by serving officers. SIR H. BRITTAIN'S suggestion that similar support to that extended by the United States Government should be given to British attempts, met with no reply.

DH

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MILITARY TYPES.

Type.	Engine.	Duty.
D.H. 9	230 h.p. Siddeley "Puma."	Bomber, Reconnaissance and Photographic Machine.
	350 h.p. Siddeley "Jaguar."	Reconnaissance Fighter.
D.H. 9a	360 h.p. Rolls-Royce. Mk IX. 400 h.p. Liberty. 450 h.p. Napier "Lion.'	High Performance, Reconnaissance Bomber.
D.H. 38	450 h.p. Napier "Lion."	Long and short distance daylight Reconnaissance Bomber.
D.H. 49	360 h.p. Rolls-Royce. Mk IX. 450 h.p. Napier "Lion."	High Performance General Purpose Military Aircraft.
D.H. 53	6 h.p. (696 c.c.) Blackburne.	Light Monoplane for Training and Practice.

COMMERCIAL TYPES.

Type.	Engine.	Useful Load.	Cruising Speed.	Range.
D.H. 9c	**230 h.p. Siddeley "Puma."** **Used on the de Havilland Aeroplane Hire Service and on the Seville—Larache (Spain), and Charleville — Cloncurry (Australia) Air Lines.**	3 Passengers or 650 lbs. Freight.	85-90 m.p.h.	500 miles.
D.H. 34	**450 h.p. Napier "Lion."** **Used on the London — Brussels — Cologne, London—Amsterdam—Berlin and other Air Lines,**	10 Passengers or 2,450 lbs. Freight.	105 m.p.h.	370 miles.
D.H. 50	**230 h.p. Siddeley "Puma."** **Used on the de Havilland Aeroplane Hire Service. Winner of Traffic Competition, International Aviation Meeting, Gothenburg, 1923.**	4 Passengers or 1,000 lbs. Freight.	100 m.p.h.	400 miles.

SPORTING, TOURING & TRAINING TYPES.

Type.	Engine.	Short Description.
D.H. 37	270 h.p. Rolls-Royce "Falcon."	Designed specially for High Speed Touring. Accommodation for two passengers with ample room for luggage. High Performance and long range.
D.H. 53	6 h.p. (696 c.c.) Blackburne.	Light Single-seater Monoplane. Top speed, 73 m.p.h. Landing speed, 33 m.p.h. Climb, 370 ft. per minute.

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AERIAL SURVEYING IN CANADA.

The paper on Aerial Survey research at Cambridge, which was read by Mr. Hamshaw Thomas before the R.Ae.S. last week, finds an appropriate supplement in an article by Mr. A. M. Narraway which appears in the January issue of the "Journal of the Dominion Land Surveyors' Association," published at Ottawa, entitled Practical Application of Aircraft to Surveying.

Mr. Thomas' paper dealt with the application of vertical photography over relatively flat country. In this type of work the maintenance of accurate straight and level flight at a uniform height is essential to the accuracy of aerial survey except in such cases as aerial photographs are used only to fill in detail over an area in which accurate positions for a large number of points can be fixed by ground surveys. Even in this case accurate level flying greatly facilitates the work of map compilation.

Limitations of Vertical Photography.

The vertical photograph can cover but a limited area per exposure, though within the area covered it gives very great wealth of detail with very considerable relative accuracy. The absolute accuracy of scale of such a photograph can in practice only be checked from an accurate knowledge of the positions of points shown on the photograph. The Cambridge experiments show that it is possible under proper conditions to maintain a high degree of accuracy in flying over a predetermined course and that a strip of photographs of very considerable length can be corrected to quite a reasonable accuracy if points accurately fixed by ground survey are included at or near the two ends of the strip. That is to say that given careful flying it is permissible to average out the accumulated errors between the beginning and end of each particular strip as though there had been a steady divergence from a true course over the whole flight.

It is obvious that the longer the distance intervening between known fixed points the greater are likely to be the errors which will occur in this type of survey. Also because of the limited area covered by individual photographs surveys of enormous areas will become impossible simply by reason of the enormous number of photographs which must be taken.

Experiments in Canada.

The experiments which form the subject of Mr. Narraway's article, carried out by the Royal Canadian Air Force under the direction of officers of the Topographical Survey of Canada, were divided into two classes, one concerning the use of aerial photographs to supplement ground traverses in unmapped territory, and the other devoted to the use of aerial survey to supplement ground surveys in more or less settled areas. The second class of work alone can usefully be served by the vertical photographic method, but even for this class of work the large areas which require to be covered have led to the use of oblique photographs.

In the case of the first class of work vast stretches of unmapped and unexplored territory in the North-West of Canada require to be surveyed to provide control maps for geological and forestry investigations. The method hitherto employed was for the surveyor to traverse the main waterways of the district, fixing by surface methods the position of a chain of points along the shores, and filling in details of the shore line or of such other features as were visible by the use of cross bearings, or similar normal methods. The course of each such traverse is arranged to form a circuit closing up on some previously surveyed circuit, and in this way a network of surveyed waterways is gradually built up. The country is generally flat and the range of vision from the waterway is limited. The coasts of the waterways are intricate, details are often obscured by islands, and therefore these surveys fail to reveal much important detail even of the waterways themselves, and leave the districts between individual traverses blank.

Aerial Photography provides the means of filling in the missing details. The vertical photograph method, however, is out of the question, if only on account of the vast areas to be covered. The oblique photograph supplies a method by which large areas may be covered by each exposure. Not only does it do this, but it allows the aircraft—in this case a seaplane—to photograph the country at some distance from the waterway which forms its only practicable alighting surface.

Mapping the Far North-West.

During 1923 a survey party in Manitoba surveyed by the usual surface methods some 940 miles of waterways. Early in September a flying-boat was despatched to fly over the routes in question. The crew of the boat consisted of pilot, engineer and a surveyor thoroughly experienced in northern surveys, who had also been trained in Aerial Photography. The boat was equipped with the latest type of Fairchild camera mounted in the nose of the boat and arranged so that it could be used to sweep and to tilt through 180 degrees. It had been intended to work from 10,000 ft. and to carry out the work in the early summer when the light was at its best. It was found impossible to maintain the proposed height, and the majority of the flights were made at only 4,000 ft. The work was also delayed until the light conditions were poor. Nevertheless seventeen and a-half hours in flight sufficed not only to cover all the territory covered by the surface survey, but other water features and two base lines, one of over 150 miles in length.

The Use of Oblique Photographs.

The method adopted was to take oblique photographs straight ahead at intervals of about three miles. This secured that the foreground of each exposure overlapped the background of the preceding film. Between ahead photographs side views at about 45 degrees on each side were taken, and in this way a strip over ten miles wide was covered on each flight. In making the photographs care is taken to show the horizon near the top of each picture. It will be evident that in flat country the line from lens centre to horizon is a definite datum line, and the position on the photograph of the horizon line is by itself sufficient to determine the perspective of the particular photograph. On each photograph it is possible to draw what is known as a "grid," a network of lines which represent on the photograph two sets of parallel and equidistant lines on the ground which divide up the ground into squares. It is then only necessary to know the position of two points shown in the photograph to obtain the scale and the orientation of the photograph and to replot it in chart form. With the aid of the points fixed by the ground traverse survey quite a high order of accuracy is obtained, and all water areas and important topographical features in the vicinity of the traverse can be shown in accurate position.

Large lakes and similar features in the background of the side views out of range of accurate plotting can be sketched in with approximate accuracy. A large proportion of the territory photographed is strictly unmapped and often only of prospecting importance. Approximate plotting from a photograph gives in these cases much useful information, indicating the routes through the country, the approximate position of lakes and streams, and the general nature of the country which is all that is usually necessary until the district is developed sufficiently to warrant more accurate survey.

Imperfection of Existing Maps.

Mr. Narraway states that the most striking feature observed in flights over districts when only sketch maps based on track surveys were available was the misleading nature of these maps. Often where only a single line of waterway was shown on the map the country was actually a maze of waterways and it was quite difficult to distinguish which was the one shown on the map. On the best existing map Kississing Lake is shown as a very large body of water with more or less regular coast lines with a few well defined islands and large stretches of open water. Photographs show that the lake is really much smaller, has very irregular coast lines, with a number of narrow bays over 20 miles deep practically filled with islands and having very few large areas of open water. Many other instances occur where important features which are quite out of range of the ground party traversing a waterway have been revealed and can be plotted on the map.

Present maps of Northern Canada are based solely on ground traverses and are very little more than guides to the particular tracks covered by the surveying parties. The use of aerial photography will greatly expedite the making of maps of the district and maps so made will be much more complete than those produced solely by ground methods, not only as to the water boundaries, but regarding the nature of the forest cover, the location of rock outcrops, swamp, etc.

Surveys in Settled Areas.

In the relatively settled parts of Canada large areas of land have been accurately surveyed and divided up into sections and quarter sections actually marked in bush country by cut out lines. On the open prairie roads and other features such as the boundaries of occupied lands serve to define these lines. Although there is thus an accurate network of surveyed lines the survey was carried out to define sections for settlement purposes and topographical detail was given little attention in the process. Thus even in the settled areas existing maps are lacking in detail and often inaccurate as to topography. The land classification surveys conducted in Western Canada are engaged in examining, mapping and reporting upon vacant quarter sections. Aerial survey methods have been tested to relieve the parties engaged on this work of much of their mapping work. The existing section lines on the earth provide a ready-made grid on oblique photographs which have only to be sub-divided into smaller squares to permit of accurate plotting.

Oblique photographs taken for this purpose show beyond doubt that the work of the detailed survey can be greatly lightened and that the maps resulting will be more complete and accurate. It is proposed that the aerial photographs should be taken before the surveyor takes to the field and that the photographs will then greatly facilitate the ground work.

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Vertical photographs were also found to be admirable for this class of work, but the area covered was too limited. Difficulty was also encountered in flying at an even altitude in successive flights and in completely covering the area.

It is proposed in future to fly at 10,000 ft., when each photograph will cover 1.7 × 2.1 miles and to mount photographs in north and south strips using the one-mile apart section lines as a guide. It is felt that even if small areas are missed by the photographs, the surveyor will know accurately their position and extent and will have little difficulty in filling in the detail locally.

From this necessarily abbreviated account of Mr. Narraway's article it is fairly obvious that aerial surveying in Canada is not an as yet undeveloped alternative to a rigid trigonometrical survey by ground methods, but a practical method of making a detailed survey where ground methods are impracticable simply because of the lack of communications, and the enormous expenditure of time and money which would be involved by their use.

There is a certain school of thought that regards aerial survey work as of relatively little value, because they are accustomed to surveys of the nature and accuracy which is possible in a highly developed European country, and because in order to give a reasonable degree of accuracy to maps plotted from aerial photographs a ground control survey must be made.

In countries such as Canada the degree of accuracy maintained by the British Ordnance Survey is not urgently necessary, at any rate in the unsettled parts. What is required is a reasonably accurate map of the natural lines of communication, and a reasonably accurate knowledge of the country to which these communications give access. Except to the explorer and the tramp a road is of little use if nothing is known as to what is to be encountered along it. The ground traverse is sufficient to locate the position of the route in space—it fails to reveal much else—and aerial photography supplies the want rapidly and relatively cheaply.

Obviously there is an enormous scope for work of this kind—not only in Canada, but in many other unmapped districts of the World. Equally obviously there is room for the improvement of aerial surveying equipment, both as regards machines and photographic apparatus, and for the development of systematised methods of using that equipment.

It will be noted that in connection with the use of vertical photographs the Canadian experiments have encountered difficulties which it is claimed have been overcome in the recent experiments at Cambridge described by Mr. Thomas. This is important as showing that experimental work in this country—where a very accurate ground survey makes it possible to ascertain the accuracy of aerial surveys to within very close limits—can be usefully applied to the problems of mapping the more desolate spaces of the earth.

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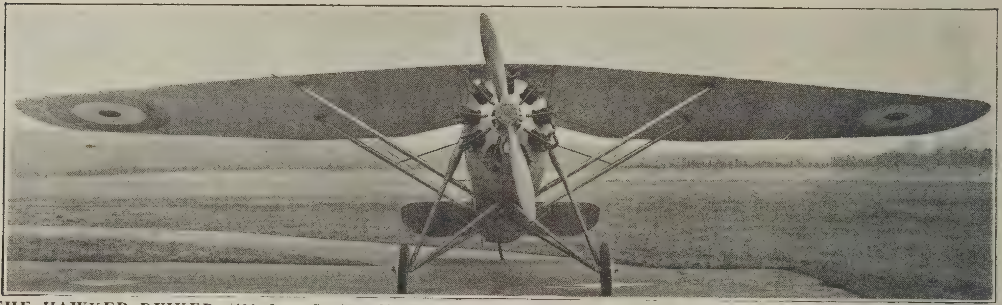


THE HAWKER DUIKER (400 h.p. Jupiter Engine).—A two-seater fighter monoplane designed and built by the H. G. Hawker Engineering Co.

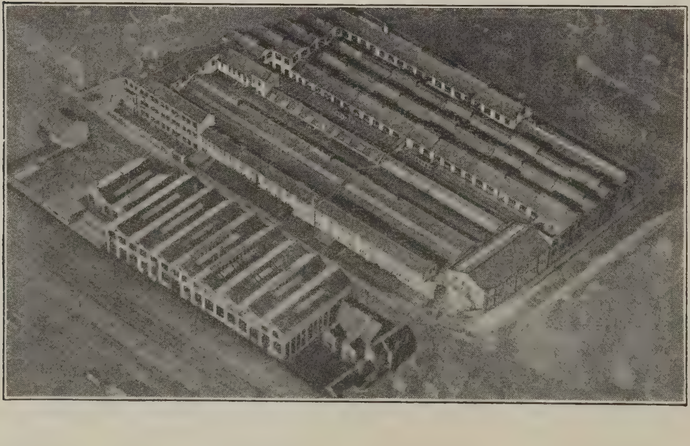
The first thing that strikes a visitor to the works of H. G. Hawker Engineering Co. Ltd. at Kingston is the extraordinary care with which all work to the most minute detail is carried out. Nothing is too small to be given its full care and attention with the result that all machines which leave the works are finished off in a manner which one has seldom before seen equalled anywhere except in special show jobs.

The Company have now taken over the whole of the old Sopwith works and every single shop is going at full blast. The works and offices are exceedingly well built and it is obvious that no expense was spared when they were originally erected in 1917.

A great part of the works are at present occupied in reconditioning Snipe and D.H.9as for the Air Ministry. "Reconditioning" as done at the Hawker Works is rather a misleading word seeing that the machines are almost entirely rebuilt of completely new material and when returned to the Air Ministry they are actually in fact new machines. Another important production job on which the Company are engaged is a sub-contract from the Fairey Aviation Company for the building of undercarriages and other parts for Fairey Fawns.

The first original machine which the firm has produced is the Duiker. This is a two-seater monoplane with a Bristol Jupiter or Armstrong-Siddeley Jaguar engine and has been flying for some time with conspicuous success. At the moment a new type of wing for the Duiker is being built with which it is expected to better the performance to a large extent. A large amount of experimental work is being done but unfortunately as this is of a secret nature no reference to it is allowed.

Under the guidance of Mr. Sigrist who with Mr. Sopwith is joint managing-director of the firm, one was shown the numerous schemes employed for the improvement of detail work. For preparing old exhaust pipes and such things for enamelling or painting the old method was to clean up the pipes by hand. This method was not good and it was also slow. Nowadays this is done at the Hawker Engineering Works by sand-blasting which method



A photograph taken from the air showing the old Sopwith Aircraft factory at Kingston. The whole factory has been taken over by the Hawker Engineering Co. Ltd. and is now in full swing.

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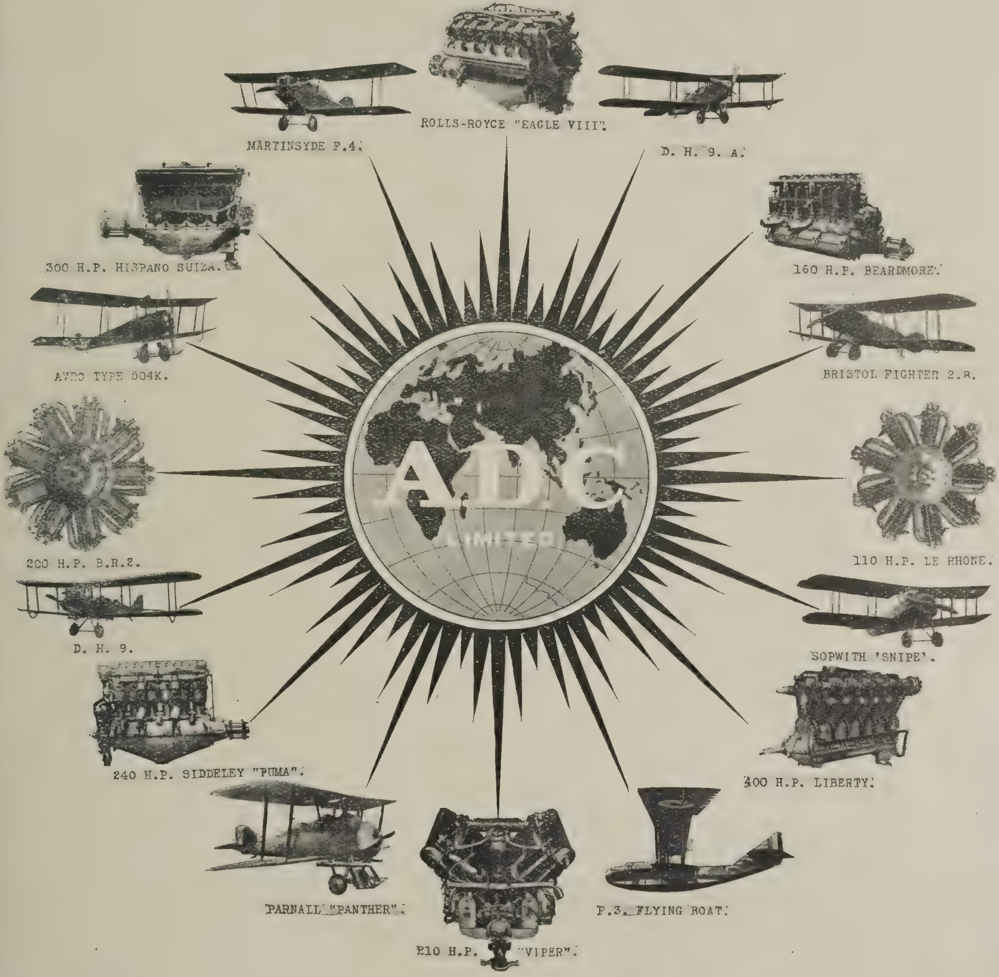

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scrapes every little bit of paint, rust or grease from every portion of the object which is being so treated. Similarly instead of painting with paint or enamel, the paint or enamel is sprayed on so that every corner or crevice of the obbject gets its full share. Both these processes take but a fraction of the time taken by the old methods.

Each separate shop is self-contained and has its own private tools and stores so that a job can be finished in its particular shop, thus obviating the necessity of a man having to go to another shop if he wants any particular part drilled.

The drawing office is large and thickly populated and is under the guidance of Mr. Carter who is evolving one or two exceedingly interesting machines, one at least of which is likely to cause something of a sensation. The Hawker Works have undoubtedly got one of the most up-to-date factories in the country to-day and furthermore they have all the necessary plant laid down to put their machines into production at any moment.

Helium in the Empire.

The use of helium in place of hydrogen for the inflation of airships has been the subject of a good deal of discussion, very particularly in the United States of America. It has been claimed that the United States possesses a practical monopoly of helium supplies and a unique experience in the practical extraction of helium from the natural gases in which it is found in appreciable quantities.

A recent survey of the helium resources of the United States leads to the estimate that over 50,000,000 cubic feet per annum of this gas could be extracted annually using five or six extraction plants, and that this output could be doubled in an emergency. The cost of helium extracted at Fort Worth, Texas, towards the end of the war was \$100-\$150 (£20-£30) per thousand cubic feet. It is estimated that with new plant this figure can be reduced to \$30 (£6).

It is well to remember that the initiative in regard to helium for airships was taken by the British Government as early as 1915, and that a survey of the helium resources of Canada was carried out in that year by Prof. McLennan of Toronto, and that the natural gas wells of Canada have been shown to produce helium in very considerable quantities.

There is very little room for doubt that the United States authorities have exaggerated both their own natural advantages in the matter of helium resources and the importance of helium, partly to justify their very considerable expenditure on experimental helium production. But as has often been pointed out, petrol is much more dangerous a source of fire on the airship than is the hydrogen and it may well be held that the British development of engines for airships which will run on a mixture of paraffin and hydrogen is a greater contribution to the safety of airships than can be provided by the use of helium. It may be pointed out that this type of fuel cannot be used on a helium-filled airship.

For any but war purposes the cost of helium is absolutely prohibitive, and for war the great advantage of using paraffin and hydrogen as fuel cancels its apparent advantages. Eventually, high flash-point fuel without the addition of hydrogen may come into use, but it may reasonably be expected that by that time the problem of separating helium from the other gases with which it is always found—possibly even from the atmosphere—will present fewer practical difficulties than they do to-day.

In any case however it is comforting to recollect that in Canada at least very important supplies of helium are known to exist.

Awards to Inventors.

The Royal Commission on Awards to Inventors has had before it during the past two weeks a claim by the Aircraft Manufacturing Company and La Société des Moteurs Gnome et Rhone in respect of royalties for the use of rotary engines made under patents belonging to the Gnome and Rhone firm. The Aircraft Manufacturing Company held licences for the use of these patents in Great Britain.

A sum of over £8,000,000 had been spent by the Crown on engines and spare parts covered by these patents and altogether between 50,000 and 60,000 of these engines had been supplied to the Allies as a whole.

It was claimed for the Crown that the Government should not be liable for royalties in respect of spare parts even when these were covered by patents, and that the patents generally were not of such outstanding merit as to justify any further payment by the Government than had already been made. One or other of the claimants had already received £372,000 in royalties.

The claim is still the subject of argument.

The New Beardmore Engine.

In a paper read before the Scottish Branch of the Royal Aeronautical Society at Glasgow on Feb. 20, Mr. A. E. L. Chorlton gave some description of the new Beardmore engines of the type known to the Air Ministry as the "Cyclone."

Mr. Chorlton said that Beardmores were the earliest makers in this country of the six-cylinder-in-line type of aero-engine, and that experience of many years had shown that in reliability and economy this simple type was the most satisfactory. They had accordingly concentrated on the development of the in-line type of engine. The old objection of increased weight had been overcome by skill and experience in design.

The new Beardmore engine was made either as an eight-cylinder or six-cylinder, and of either the vertical or the inverted type. All parts throughout were interchangeable and replaceable in position. The separate cylinder covers could be removed, valves reground, and even pistons and connecting rods could be removed without dismantling the whole engine. The whole drive to cam-shaft, magnetos, pumps, etc., was a separate unit which could be replaced from stock if necessary.

The type therefore should be extremely cheap to overhaul and maintain in civilian service.

The cylinders were 8 9/16 in. bore by 12 in. stroke. The normal speed was 1,220 r.p.m. at which the six-cylinder unit developed 800 h.p. and the eight-cylinder 1,050 h.p. The weight of the two engines was 1,825 and 2,350 lbs. respectively—very closely 2¼ lbs. per h.p.

A specially simple type of starting engine was fitted, in which one piston and connecting rod served both for the power stroke and for providing compressed gas.

Mr. Chorlton said that an engine of the same type, but fitted with cylinders of smaller bore, and fitted with a fuel-injection pump had been made to run on crude oil, but it gave less power than did the petrol engine. One assumes that the smaller bore is used so that the same connecting-rods, crank-shaft and other working parts shall be enabled to stand the higher maximum pressure necessary for ignition by compression.

Dewoitine Enterprise.

One of the most recently formed firms of aircraft constructors in France, that of E. Dewoitine, of Toulouse, apart from producing some very successful designs, is taking very active steps to bring these aircraft to the notice of the World.

It will be remembered that they produced one of the first successful gliders in France, and subsequently fitted it with a small engine, transforming it into the first successful light aeroplane in France. This machine achieved the first double crossing of the Channel for a light aeroplane and later M. Dewoitine took the machine to the United States where, piloted by M. Barbot, it created quite a sensation.

Since then Lieut. Thoret has demonstrated the machine in Czecho-Slovakia, and some machines have been sold to Bolivia.

M. Dewoitine has since produced a single-seater all-metal monoplane fitted with the 300 h.p. Hispano-Suiza engine. The machine, known as the D.1.C.1., has produced remarkable results in the hands of the French Section Technique.

Quite recently an Italian Commission has been inspecting it and have actually carried out flying tests on it at Villacoublay. On Feb. 23 M. Doret left for Serbia to demonstrate the machine to the military authorities at Orsova and in a few weeks M. Barbot leaves for Japan with the same object. before he leaves, he is to make an attempt to beat the height record and in a preliminary test recently he reached a height of 10,200 m. (33,456 feet), in record time, this climb being interrupted by failure of the oxygen apparatus.

A Handy Chart.

A copy of the Brooksway Engineer's Table has been forwarded to The Aeroplane by the publisher, H. Brook, of Skippool, Boulton-Le-Fylde, Lancaster. This consists of a single sheet about 18 in. by 24 in., on which is collected data as to equivalent measurements which are frequently needed by engineers and mechanics and is normally only to be found after consulting a number of separate tables.

For each 1/64 of an inch, from 1/64 up to 1 inch, the table gives the decimal equivalent to the nearest .001, the metric equivalent, the nearest S.W.G. size, the nearest drill gauge size, the nearest B.A. screw diameter, the number of threads per inch for that diameter in B.A., B.S.F. Brass and Cycle Thread, Whitworth and Pipe standards, the corresponding tapping size for the various threads, the spanner jaw opening for nuts, the circumference of the circle, and the weight per foot run of round wrot iron rod.

In addition a table of gears for cutting inch, metric and B.A. threads on a lathe is given.

Copies of this chart can be supplied by Mr. Brooks post free, price 6d. each, on application.

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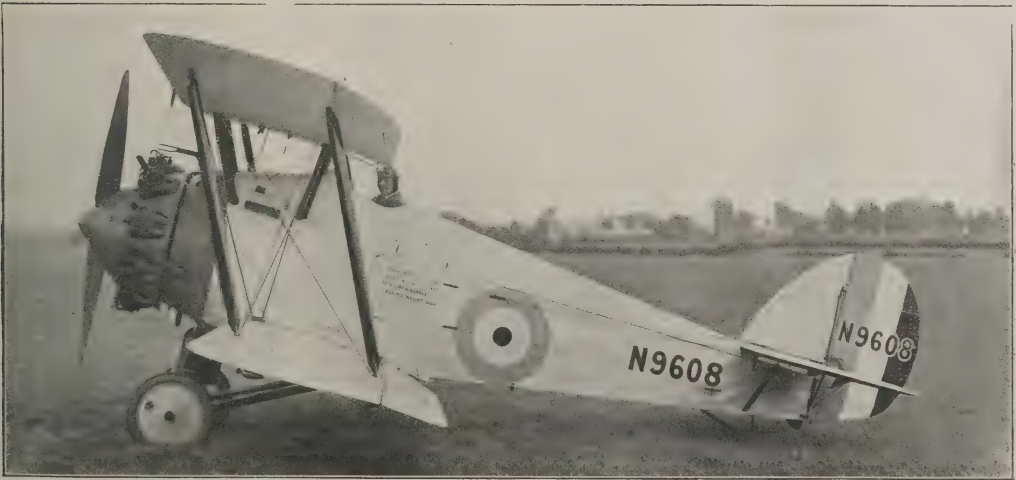

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 7; Tuesday, 5; Wednesday, 12, Tuesday, 7; Friday, 6; Saturday, 8; Sunday, 1.

London—Paris—Zurich:
Handley Page Transport, Ltd., machines 7, passengers 12, freight 5,212 lbs
London—Ostend—Cologne:
Instone Air Line, Ltd., machines 8, passengers 7, freight 11,276 lbs
Manchester—London—Rotterdam—Amsterdam—Hanover—Berlin:
Daimler Airway, machines 14, passengers 5
Paris—London:
Air Union, machines 5, passengers 4, freight 8,291 lbs.
London—Rotterdam:
K.L.M., machines 12, passengers 10
Special Machines: 0.

Total number of trips by British machines: 29, carrying 24 pas. Foreign machines: 17, carrying 14 passengers.

Comparative Figures:
For week ending Mar. 2:
Machines, 46; Passengers, 38; Crews, 72; Total personnel, 110
Corresponding week, 1923:
Machines, 53; Passengers, 164; Crews, 102; Total personnel, 266.
Corresponding week, 1922:
Machines, 45; Passengers, 81; Crews, 74; Total personnel, 155.
Corresponding week, 1921:
Machines, 30; passengers, 32: Crews, 38; Total personnel, 70.

Croydon Notes.

The weather was the cause of a big falling off in the number of passengers who travelled on the air lines during the week. There were no blank days but the weather except on Saturday has been very bad.

The guessing competition with regard to the personnel of the Imperial Air Transport Company is now in full swing. It is thought that Col. Searle will be Managing Director with Major Woods-Humphrey as General Manager, Mr. Savage as chief engineer, and the traffic manager will be one of the present Instone officials. There will be several posts at the various terminals abroad which will absorb many of the remainder of the personnel of the present companies. All rumours should be received with the strictest mental reserve.

The new D.H.34 for the Daimler Airway arrived at Croydon on Saturday. The machine bears the registration of G-EBCX which the late Mr. Pratt crashed at Rotterdam in the summer. The chord of the wings is about eight inches bigger than on standard 34s and the span is also appreciably bigger. The machine is now waiting for its airworthiness certificate.

K.L.M. have had an inquiry asking for terms for the conveyance of corpses by air. One understands that this practice is not looked upon at all favourably by pilots and their point of view is quite understandable. From the air line manager's point of view however it is a paying proposition

A contract has been placed with the Instone Air Line for transporting 50 tons of motor-cycle to Cologne. The consignment will go over in 70 flights.

The Daimler Airway have now re-opened the service to Manchester. Machines will leave Croydon at 08.30 hrs. and 13.00 hrs. and will leave Manchester at 11.00 hrs. and 17.00 hrs. For the moment only one service per day is running but as soon as "CX" gets her airworthiness certificate the full service will run. It is hoped that during the Exhibition at Wembley the service will stop *en route* at an aerodrome near the exhibition grounds.

On Monday of last week one of the Goliaths belonging to the Air Union was caught in a snow-storm over the Channel and the pilot was unable to see a yard. He was guided to Croydon by directional wireless and fortunately was not jammed by spark stations and concerts at Amsterdam and elsewhere working on too near the 900-metre wave-length.

Flying in Cornwall.

The Berkshire Aviation Tours are still doing well in Cornwall. At St. Anstell they took up 605 passengers in ten days and at Bodmin 514 were carried in a similar time. The machines are now at Truro and Wadebridge and so far 245 passengers have been carried in four days.

Much amusement and some amazement has been caused by a letter to the *Western Morning News and Mercury* from a Wesleyan Minister who doubtless is very well meaning as well as being narrow-minded. He protests against Sunday flying and styles it as outraging "the convictions of all right-minded people on God's day." What seems to annoy the worthy man particularly is that the hoardings advertise "Fancy and Crazy Flights." Evidently to the well-meaning this is specially naughty on a Sunday.

However, as these letters afford an excellent advertisement free of cost, Mr. Holmes is not worrying much.

French Statistics.

The Minister of Public Works in France has stated that the amount of material for aviation imported during 1923 totalled 107,000 francs and exports totalled 26,469,000 francs. The number of fatal accidents in connection with Civil Aviation amounted in 1920 to 14 for 853,959 km. In 1921 the figures were 15 accidents for 2,353,455 km. In 1922 they were 13 accidents for 2,798,366 km. and in 1923 they were 6 accidents for 3,387,195 km. During the first ten days of February 53 aeroplanes arrived and left Le Bourget carrying 121 passengers and 10,992 kg. of goods and 43 kg. of mail.

An Error.

In the advertisement of the De Havilland Aircraft Co. Ltd. in The Aeroplane of Feb. 27, it was said that the distance between Charleville and Cloncurry in Queensland was 385 miles.

For the benefit of the ignorant—which includes the majority of the staff of this journal—it seems well to state that the distance is in fact 585 miles. The extra 200 miles will help readers to realise the excellence of the performances of the pilots, and mechanics and the Puma engines and de Havilland aeroplanes who and which have kept this route running with so much regularity.

PERSONAL NOTICES.

Deaths.

BOND.—At Duxford, Cambridge, on Mar. 3, as the result of a collision in the air, G. T. Bond, Serjt. Pilot, R.A.F.

LISTER.—At Biggin Hill, Kent, on Mar. 3, as the result of a flying accident S. Lister, Sjt. Pilot, R.A.F.

PECK.—At Duxford, Cambridge, on Mar. 3, as the result of a collision in the air, Jasper Godfrey Peck, Flg. Off., R.A.F.

SMITH.—At Biggin Hill, Kent, on Mar. 3, as the result of a flying accident, Sydney William Smith, Flg. Off., R.A.F.

SOLOMON.—On Feb. 29, at 2, Cleve Road, West Hampstead, Joseph Hubert Solomon, only son of David and Phillis Solomon, late Lieutenant, R.A.F., aged 25 years.

Marriages.

STARBUCK—FREEMAN.—On Feb. 26, at Christ Church, Sutton. Norman Henry, only son of Mr. and Mrs. J. H. Starbuck, of Wavertree, Sidcup, to Grace Mary, younger daughter of Mr. and Mrs. C A Freeman, of Kinsale, Sutton.

Engagements.

BARRETT—HEXTALL.—The marriage arranged between James Burney Barrett, R.A.F., youngest son of Mr. and Mrs. Arthur Barrett, late of Padstow, Cornwall, and Joan Margaret Hextall, youngest daughter of Mr. and the late Mrs. Henry Hyde Hextall, of 24, Cottesmore Gardens, London, W.8., will take place on Mar. 25.

PUMPHREY—PUMPHREY.—The marriage arranged between Mr. Frederic Alan Pumphrey, R.A.F., third son of Mr. and Mrs Frederic Pumphrey, of Vancouver, B.C., and Muriel, youngest daughter of the late Mr. T. E. Pumphrey, J.P., and Mrs. Pumphrey, of Mayfield, Sunderland, will take place on Mar. 4.

Births.

COX.—On Feb. 26, at 3, Woodlands Crescent, N.W.11, to Dorothy, wife of Dudley F. Cox, R.A.F.R.—a son.

SCOTT.—On Feb. 27, at Bournemouth, the wife of Flt. Lt. Charles Langston Scott—a son.

WILLIAMS.—On Mar. 2, at 129, Wigmore Street, W.1, to Sq. Ldr and Mrs. F. G. Maxwell Williams—a son.

Fluid Propulsion

The following new company has been registered:—

Fluid Propulsion, Limited, was registered on Feb. 20, as a private company with a nominal capital of £1,000 in 100 founders' shares of 1s. each and 995 7 per cent. cumulative preference shares of £1 each. The objects are: to acquire patent 24,001 of 1910, granted to Nikola Tesla, for an improved method of imparting energy to or deriving energy from a fluid, and apparatus for use therein, and all present and future inventions by him, with respect to fluid propulsion, in Great Britain and Ireland, the Isle of Man and all British Colonies except Canada; to acquire various patents granted to the vendor (1) for improvements in methods of and apparatus for the generation of power by elastic fluid turbines, (2) for an improved process of and apparatus for production of high vacua, (3) for method of and apparatus for aerial transportation, (4) for improvements in the construction of steam and gas turbines, (5) for improved method of and apparatus for the economic transformation of the energy of steam turbines, and (6) for improved process of and apparatus for deriving motive power from steam; to adopt an agreement with the said Vendor and J. R. Hatmaker, and to carry on the business of manufacturers of turbines, motors, engines, pumps, vacuum pumps, compressors, refrigerating apparatus, helicopters, flying machines automobiles, boats ships, locomotives and machinery, etc.

The first directors are:—N. Tesla, 8, West Fortieth Street, New York City, consulting, electrical and mechanical engineer (President Tesla Company, Incorporated, New York) J. R. Hatmaker, 72, Avenue d'Jéna, Paris (director of Ambrosia, Ltd., London, and President of Mammala Corporation and Ambrosia Milk Corporation, both of New York). F. M. T. Lango, 35, Gloucester Gardens, Bayswater, W.2, engineer

The founders' shares confer the absolute control of the management Holders of founders' shares No. 2-46 may appoint one director, and holders of founders' shares 47-91 have a similar right. N. Tesla and J. R. Hatmaker are deemed to be the first nominees.

The founders' shares take (a) all the profits after payment of the preferential dividend, and (b) in any winding up, all surplus assets after repayment of capital on the preference shares. The founders' shares, other than those subscribed for by F Lange and those to be issued to N. Tesla and J. R. Hatmaker under the above-mentioned agreement, are to be issued only for cash, on such terms as may be fixed by the directors, but none of them shall be issued to either N. Tesla or to J. R. Hatmaker.

The registered office is 164, Buckingham Palace Mansions, S.W. The file number is 195,869

E Engineering

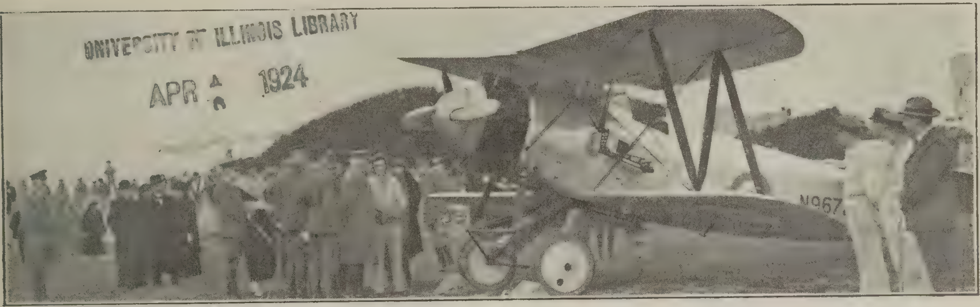
THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXVI. No. 11. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

CO-OPERATION.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A FEATHER IN THE CAP OF THE R.A.F.:—A Fairey Flycatcher (400 h.p. Armstrong-Siddeley Jaguar) at the Calafrana Aerodrome, Malta, being inspected by Field-Marshal The Lord Plumer, G.C.B., G.C.M.G., G.C.V.O., Governor and Commander-in-Chief of Malta. Here is seen a deck flying machine belonging to the Fleet Air Arm which is used for co-operation with the Army.

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SEE PAGE 221 FOR PALMER LANDING WHEELS AND TYRES. (223)

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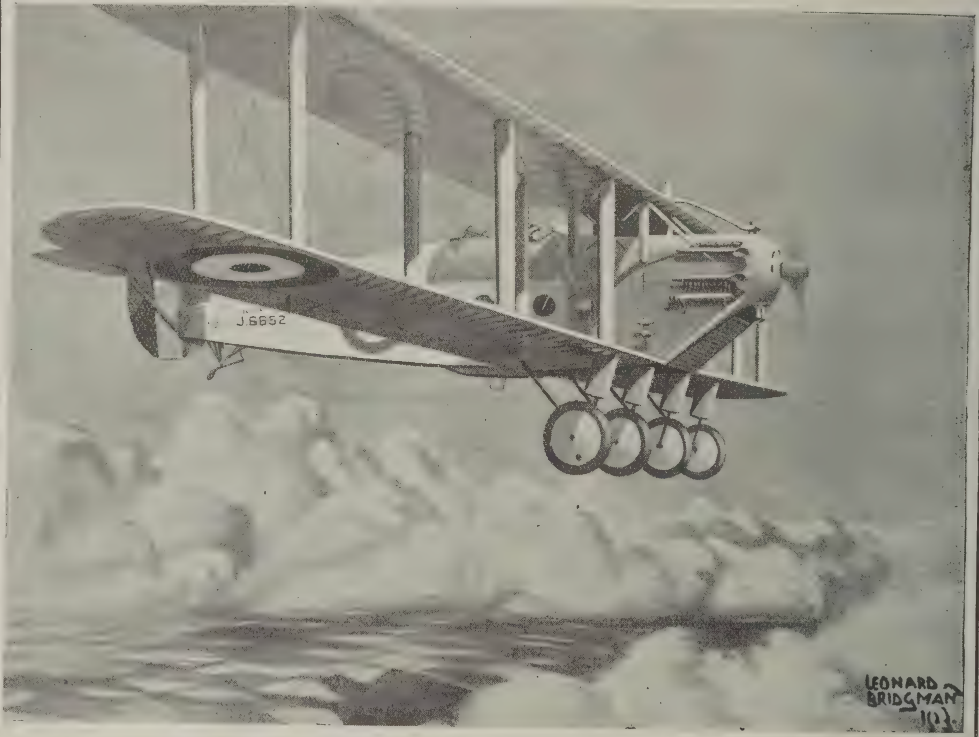

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This Bomber is a further development of the AVRO "Aldershot," which won the Air Force Handicap at the R.A.F. Pageant, 1922. It is fitted with dual control, and the whole of it, with the exception of certain parts of the wings, is constructed of metal. The wings are designed to fold back so as to economise space when the machine has to be stored.

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MAR. 12, 1924.

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Incorporating

Aeronautical Engineering

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No. 11.

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ON THE AIR FORCE AND SINGAPORE.

Whether the Admiralty is ordered by the Government to abandon its project for building a first-class Naval base complete with dockyards at Singapore or not does not in the least affect the importance of Singapore in the strategic scheme of the Next War. Singapore will still be the key position to the passage of an enemy fleet from Japan into the Indian Ocean and from Singapore must operate sea or air patrols to block the passage of a fleet or of individual ships through the Malay Archipelago. But whether the Navy builds its dockyard there or not will make a considerable difference to the position of the Air Force in relation to Singapore.

When one studies the situation one sees that the abandonment of the scheme for a dockyard at Singapore would be the best possible thing for the Air Force. And the fact that the Navy should be compelled to abandon it by a Labour Government in the interests of peace may be very much to our advantage in time of war. It seems to be merely another example of those curious acts of God which convince one that the English people for some incomprehensible reason have inherited all the blessings which some few thousand years ago were bestowed upon the children of Israel. We continually do everything that seems to be wrong and yet in the end we always turn out to be right.

Consider the position. We were informed the other day by some knowledgeable Naval correspondent that the Imperial Special Service Squadron of battle-cruisers which has recently been showing the Flag to the Empire has been unable to approach closely to the chief Australian maritime cities because of the shallowness of the water and that if unfortunately the Hood damaged her bottom by undue willingness to satisfy the Australian desire for a "close-up" the nearest dockyard at which she could be repaired would be Rosyth on the Firth of Forth.

This sad home truth was adduced as an indication that we certainly ought to have a dry dock at Singapore big enough to accommodate the Hood. As a matter of fact it is one of the best possible reasons against having a dry dock at Singapore, as anybody ought to see who considers what might have happened in the War 1914-18 at Rosyth if the Germans had had any long range bombing machines operating from Scandinavia.

The Admiralty, with its Bourbon-like habit of forgetting nothing and learning nothing, seems to wish to have its dry docks as near the fighting line as possible instead of having them at a reasonable distance behind. Having a dry dock at Singapore would be just about as reasonable as having an aircraft park on an advanced landing ground.

Suppose that in the next war we had a perfectly good capital ship of the Hood class in dry dock at Singapore and that the Navy with its usual perspicacity had organised the aerodrome at Singapore merely as a supply depot for the Fleet Air Arm and not as an immense protective aerodrome for the whole of the East Indies. The first thing to happen would be that a squadron of Japanese aircraft carriers with heavy bombers on board would come down the South China Sea to within about 300 miles of Singapore from which point it would let loose its bombs with an excellent chance of putting at least a couple of 4,000 pounders into the dry dock alongside the Hood. Which would probably mean the end of Hood and dry dock alike.

Moreover if the Admiralty established a great dockyard at Singapore and at the same time awoke to the real importance of aircraft it would mean tying down a very large force of aircraft to the defence of the dockyard, which would be sheer waste of fighting material. For the Naval idea of aircraft defence is essentially of the "passive" kind. If on the other hand the Admiralty be forced to abandon the dockyard scheme for Singapore the Navy will still be compelled to consider Singapore as the strategic key to the Far East and therefore must still use Singapore as a fleet supply base.

Then the Air Ministry will have its opportunity of making Singapore into the main base for the Royal Air Force in the Far East. For if the Air Ministry can manage to get control of the Singapore aerodrome without having it placed under the thumb of the Admiralty it will then be possible to lay down, in conjunction with the Dutch Air Force, a regular strategic and tactical scheme for the defence of the East Indian Islands and Australia against Japanese aggression.

Happily our Labour Government appears to think rather more highly of the Air Force as a first line of defence than it does of the Navy partly because aircraft are cheaper than big ships and partly because the Government has modern ideas. Also Labour Ministers seem to have a very shrewd idea that Home Defence and Imperial Defence are much the same thing. Consequently it is quite within the bounds of possibility that the Navy's loss in the matter of Singapore may be very much the gain of the Air Force.—C. G. G.

ON IMPROVING THE BREED AGAIN.

When one wrote the article entitled "On Improving the Breed" last week one was quite aware that it would stir up a considerable amount of feeling in the Aircraft Trade. Frankly that was the effect which one desired to produce, even at the risk of personal unpopularity in some quarters. And one may add that unpopularity is nothing new so far as this newspaper and its Editor are concerned. It is always worth while being personally unpopular if thereby one can cause other people to think or act along lines which produce progress. In this particular instance several people have been moved to express verbally or on paper opinions distinctly opposed to those expressed in last week's article, and a clash of opinions is always good mental exercise.

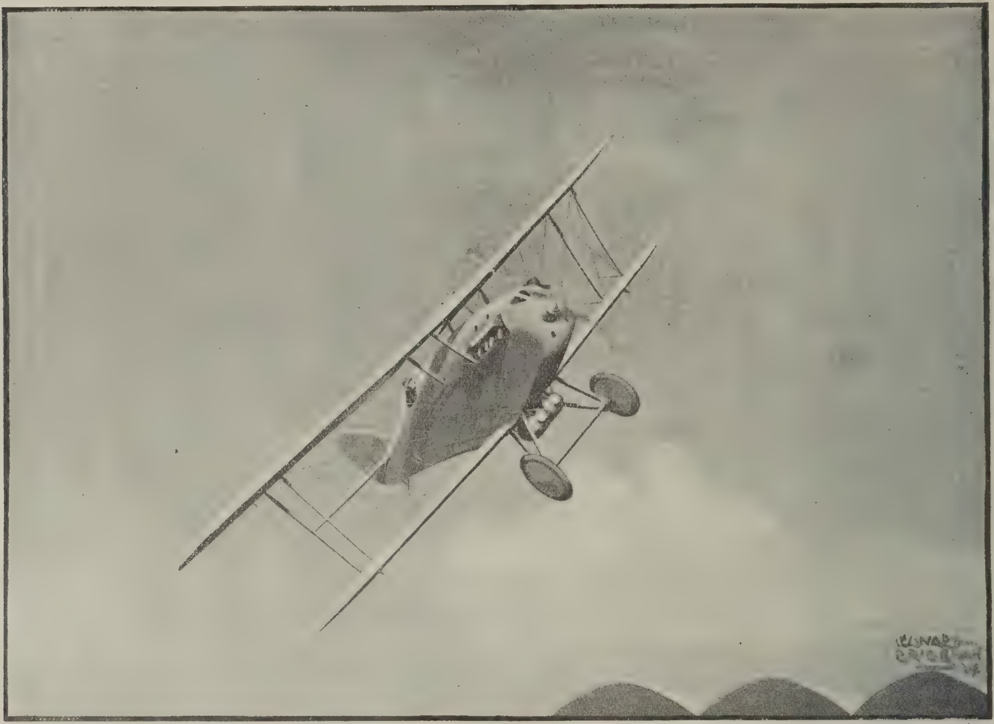
First of all it is suggested that the Curtiss D.12 engine has not passed the U.S. Government tests and that in any cases those tests are not as severe as the Air Ministry tests. One did not state that the D.12 engine had passed such tests. One merely advised those who are inclined to despise American engines to study the conditions of the type tests which have been passed by those engines. And here, in addition, one would advise such ultra-patriots to get at first-hand the opinions of officers and men of the R.A.F. who have been using American Liberty engines since 1918. It is a characteristic English vice to despise our competitors and our enemies, and we always pay heavily for doing so.

So far as the reliability of the D.12 is concerned, those who believe in it are entitled to their belief on the strength of the amount of flying done by those engines when tuning up for the Schneider and Pulitzer Trophy races and in the races themselves and the absurdly small amount of attention which the engine required as the result of all that flying. So far as one could gather the two engines used in the Schneider Trophy machines at Cowes were simply started up when the machines were wanted for the first practice flights after being unpacked from their boxes, and thereafter they received about as much attention as is usually given to the engine of a Ford car.

One does not say this because one believes that American engines are better than English engines. One merely states simple facts so that we in this country may not weaken our position by being self-complacent and may not fall into the habit of thinking that our engines need no further improvement.

Another suggestion by the critics is that the British aeroplane constructors did not go to the trouble or expense of building suitable machines to win the Schneider Trophy in 1923 and that only one aeroplane firm, the Supermarine Company, had the pluck to build a special machine in 1922. They point out that one engine firm at any rate, the Napier Company, went to considerable expense in preparing two engines specially for the race and that the firm did so without any promise from the Air Ministry of the purchase of the engine if Great Britain won the trophy. It will be remembered that the Air Ministry promised to buy the winning machine for £3,000 without the engine but in spite of that no aeroplane constructor was tempted to build specially for the race. The critics say that there was no British machine which on the face of it would have put up a better show if it had had the same engine as the American machines.

One critic puts the very pertinent query "Do you know what British Firm is manufacturing a duralumin propeller suitable for a direct-drive engine for such an event as the Schneider race last year?" He suggests very reasonably



GOOD CORNERING.—An impression by Mr. Leonard Bridgman of a Martinsyde F.4 as converted by the Aircraft Disposal Company to take Lamblin radiators. The A.D.C. have taken over the goodwill and assets of Martinsyde Ltd.

that lacking such an airscrew it was useless for any British engine firm to make a direct-drive engine for the event.

This is certainly a point well worth while considering, apart from any question of racing, because our high-performance fighting machines have now to attain a speed at which geared-down airscrews become inefficient and the weight of the gearing becomes a handicap.

These arguments, as may be seen, suggest that last week's article gives the reader the impression that if we had only had a good engine last year the aircraft manufacturers might have put up a performance which would have compared more favourably with the American performance. And they suggest that the truth is that the aircraft people did not build a machine which compared with the Americans' for lightness and efficiency, leaving any comparison of engines out of it.

All these points are very well worth studying by everybody in the Aircraft Industry, for our defeat seems to have been the result rather of a vicious circle something on the following lines :—If the Air Ministry had put up the money to build special high-speed machines designed to win the Schneider Trophy and the Pulitzer Trophy and had allowed the Royal Air Force to enter those machines for the competitions, as the U.S. Army and Navy entered for them (or if the Air Ministry had ordered the machines and had allowed the Trade to race them before delivering them to the R.A.F.) then special speed machines would certainly have been built. Failing that if aeroplane constructors could have afforded to build special machines for the events then the engine makers would probably have supplied suitable engines, if they could have got suitable airscrews for them. If engine makers had produced direct-drive engines possibly suitable airscrews might have been produced for them. And if suitable engines and airscrews had been available possibly suitable aeroplanes might have been built.

The unfortunate fact remains that none of these things did happen. And the result was that we made no sort of show at all alongside the American machines.

It now remains to be seen whether the Chairman of the S.B.A.C. who has stirred up all this controversy by boldly going to America for new notions will turn out to be a good fairy who will improve the breed of British aircraft or whether he will prove to be a wicked fairy who has merely upset the feelings of the Trade.

In any case the whole affair is bound to have good results. The best way of getting an Englishman to do anything is always to tell him that he cannot do it. And if by importing American notions in the shape of engines and wing radiators and new wing curves and tricks of reducing head resistance and so forth we can induce English designers of aeroplanes and engines to study at close quarters the methods of our victorious competitors we may rest assured that in bumping their brains against American ideas our designers may see a few stars which will light them towards fresh ideas of their own.—C. G. G.

An Apology to America.

The Editor of The Aeroplane tenders sincere apologies to the U.S. Naval Air Service in general and to Lieut. A. J. Williams, U.S. Navy, in particular, for a mis-statement published in the leading article in The Aeroplane on Mar. 5. It was therein stated that "the Army of the United States" had raised the World's speed record to 266.58 miles per hour on Nov. 4 last. As a matter of fact the said record was made by Lieut. A. J. Williams on the same Navy Curtiss Racer which had won the Pulitzer Trophy in the previous month.

Air Affairs in Parliament.

THE AIR MINISTRY.

In a written answer to a question by Colonel Vaughan-Morgan on Feb. 28 the Under-Secretary of State for Air said that the inclusive salary previously paid to the temporary official acting as personal assistant to the Air Member for Supply and Research was £585 per annum. The amount now paid to the permanent official doing the same work is £595 7s. per annum. The termination of the appointment of the former official, who had no ex-service qualifications, was a substitution under the recommendations of Lord Lytton's Committee.

MEDICAL EXAMINATION FOR THE R.A.F.

In a written answer to a question by Lieut.-Colonel Rudkin on Feb. 28 the Under-Secretary of State for Air said that the possibility of holding the medical examination prior to the Civil Service Commissioners' examination has been carefully considered and rejected. Parents and guardians are strongly recommended in the regulations to have their sons or wards examined by a medical practitioner or by an R.A.F. preliminary medical board previous to their becoming candidates for commissions in the R.A.F. and full details of the medical standards are published in the regulations. The same reasons are applicable to candidates for aircraft-apprenticeships.

RE-OPENING THE TOMB.

In the House of Commons on Mar. 5 Commander Bellairs asked the Parliamentary Secretary to the Admiralty whether, in the event of it being decided to hand over the Air Forces and their personnel associated with the Fleet to the Navy, it would be considered whether economies in personnel and material could be effected through the use of existing naval resources.

Mr. Ammon: The question is hypothetical. His Majesty's Government have no intention of re-opening a question which has already been decided after the most exhaustive inquiries by the preceding Government.

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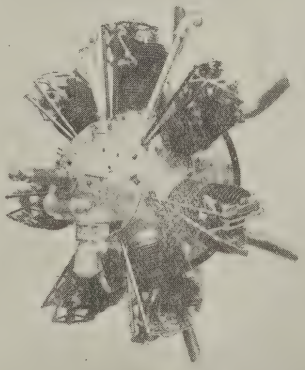

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THE AIR ESTIMATES 1924-1925.

BY C. G. GREY.

It may be assumed that the Air Estimates for 1924-25, the first ever issued by a Labour Government, are in fact exactly as they were prepared under the late Conservative Government, and that in any case neither Government had very much to do with them because they were actually compiled by the Permanent Officials of the Air Ministry. As Mr. Philip Snowden wittily remarked at the Annual Dinner of the Civil Service on March 7, "Civil Servants have authority without Parliamentary responsibility and Political Ministers have Parliamentary responsibility without authority. The authority of a political Minister is a mere similacrum of power compared with that of a permanent official."

In an introductory memorandum Lord Thomson, Secretary of State for Air, draws attention to the two new Votes, those for Medical Services and Educational Services, which are thus separated from the combatant branches. Lord Thomson says that the effective increase of £2,840,000 in the net estimates is to be allocated to the expansion of the Home Defence force and to the increased requirements of Navy and Army co-operation.

Eight new squadrons for Home Defence will be formed during 1924-25, which bring the total to 18 squadrons by April 1925. And provision is made for six more squadrons to be formed during 1925-26. Five additional flights are to be allocated to the Navy for the increased number of aircraft carriers. One extra squadron will be detailed to the Army.

Lord Thomson states that no provision is made for airships as the subject is under discussion by the Government.

He also says that economies in the Middle East will reduce the Colonial Office contribution from £5,040,800 to £3,708,850. And he concludes by saying:—

> A warning should be given that as the Air Force expands in accordance with the approved programme, and as war stocks of equipment become obsolete, the total Air Estimates must be expected to rise for some years. I may, however, point out that during the period of expansion the annual Estimates will bear the capital cost involved in the provision of land and buildings and the first equipment of the new squadrons and that therefore (unless further expansion is imposed on us) part of the increase will not be recurrent.

The net estimated expenditure, after deducting Appropriations in Aid, is £14,511,000 against £12,011,000 for 1923-24,—an increase of two and a half millions of pounds.

Provision is made for increasing the personnel from 33,000 officers and men to 35,000 of all ranks, which is exclusive of those serving in India.

Pay is increased by £31,740,—apparently £15 per annum per head for the extra 2,000 men. Quartering (or board and lodging) and transport go up £162,400—apparently £80 per annum per head for the maintenance of the 2,000. Medical services are decreased by £37,740 and Meteorological and other miscellaneous effective services are decreased by £24,000—these being the only decreases shown. Educational Services are increased by £28,900 to £480,000—a sign as healthy as is the decrease in medical services, for it is good to be able to spend more on doctoring minds and less on tinkering with bodies. Apparently this includes the maintenance of some 3,000 aircraft apprentices who are in training to become aircraftsmen.

Works, buildings and lands are increased in the net estimates £328,000,—from £1,799,000 to £2,127,000, though in the gross estimates, when appropriations in aid are taken into consideration, this branch shows a reduction of £173,000. Either way somebody will be pleased, because increased building means increased comfort for the personnel and decreased expenditure means increased comfort for the taxpayer.

Air Ministry salaries are increased by £62,000—from £648,000 to £710,000—which is little enough considering that the staff (Service and civilian) has to handle not only the men and material of the Royal Air Force as it exists to-day but has to handle the basic organisation of a force which would have to be multiplied by ten immediately on the outbreak of war. That is the reply to those critics who want to know why 35,000 officers and men should cost £20 per annum per head for Air Ministry salaries and only about £85 per annum per head for the individual pay of all ranks. And in any case the pay of any one individual is minute compared with the value of the material which he has to handle—as one has often thought when a 30s. a week pilot has cheerfully crashed a £3,000 aeroplane.

Auxiliary and Reserve Forces are set down at £284,000, an increase of only £46,000. This apparently merely indicates that pending the passing of the special Acts of Parliament affecting these forces no definite expenditure can be fixed.

Civil Aviation shows an increase of £68,000, to £355,000, and a footnote remarks pathetically "Includes certain non-effective charges in respect of this service." With full acknowledgement of the enterprise and energy of the Director of Civil Aviation and of many of the people concerned with Civil Aviation one cannot help feeling when one looks at the aerodrome statistics for 1923 compared with 1922 and 1921 that a very great proportion of our so-called commercial flying might be set down as non-effective charges.

WARLIKE STORES.

Technical and Warlike Stores will interest everybody, Service and Trade alike, more than anything else in the Estimates. This section is increased by £1,832,700,—from £3,867,300 to £5,700,000. "Appropriations in Aid," which presumably means permission to carry over last year's unexpended money to this year, amount to £1,655,000. This brings the Gross Estimate for Warlike Stores up to £7,355,000. Which is by far the biggest figure since the official end of the War in 1920.

It is only to be hoped that under the new system of separating supply and research the Air Ministry will this year spend the money which has been allotted to it, and will not fritter away the time as it did last year in futile technical arguments till it is too late to build the machines which the active service people need so urgently.

The ever helpful foot-note explains that this vote also includes "certain non-effective charges in respect of the R.A.E. Farnborough."—Again one feels that official language is occasionally unintentionally explanatory. And one suggests further that very many "non-effective charges" can be removed by a skilful combing-out of the little watertight cubby-holes in the Air Ministry itself. It is a small tooth comb rather than a Geddes axe which is required to promote the growth of efficiency.

PERSONNEL FIGURES.

The estimated officer personnel for 1924-25 shows one Air-Marshal less, owing to the promotion of the Chief of the Air Staff to Air Chief Marshal. There are four Air Vice-Marshals instead of three. There are seven Air Commodores instead of nine and 23 Group Captains instead of 24. Wing-Commanders are increased from 53 to 60, Squadron-Leaders from 172 to 185, and Flight-Lieutenants from 552 to 578. Flying and Observer Officers are increased from 887 to 970, and Pilot Officers are decreased from 290 to 273.—These are all in the General Service Branch.

Stores Officers are increased from 210 to 231 and Accountants Officers from 118 to 128. And there is only one extra Chaplain, a fact which seems to speak well for the morals of the Air Force.

Warrant Officers are increased from 200 to 244. N.C.O. Pilots are increased from 83 to 105,—though one imagines that this figure is likely to be exceeded, judging by the success of those already at work. N.C.Os. are increased from 3,257 to 3,326, Airmen are increased from 16,190 to 18,276. And Boys are increased from 172 to 207,—which obviously does not include boys in training as Aircraft Apprentices.

Naturally no estimate can yet be shown for the civilians who are to be engaged as workshop mechanics in the new Home Defence scheme.

THE RE-EQUIPMENT OF THE R.A.F.

The Aircraft Trade will be chiefly interested in the details of Vote 3 (Technical and Warlike Stores) which as already stated reaches the total of 7,355,000.

The amount set down for Aeroplanes, Seaplanes, Engines and Spares is £5,144,500, as against £3,620,000 last year,—an increase of £1,524,500. This is made up as follows:—

Complete machines,—£2,789,700 (against £1,913,400 in 1923-24).

Complete engines,—£1,450,700 (against £940,800 in 1923-24).

Machine Spares, Parachutes, etc.,—£483,000 (against £395,400 in 1923-24).

Engine Spares,—£421,000 (against £370,300 in 1923-24).

Airships,—£100 (against £100 in 1923-24).

Now it is perfectly evident that the R.A.F. did not buy anything like £1,913,400 worth of aeroplanes and £940,800 worth of engines last year. Therefore it is to be hoped that either the Air Minister will announce the sum which was so spent or that some enterprising Member of Parliament will extract the figure by means of questions. The difference between the estimate of nearly £3,000,000 and the actual expenditure will give some measure of the inefficency of the Supply and Research Departments and of their failure to re-equip the active service squadrons of the R.A.F., which are still using aeroplanes and engines of 1916-17 designs.

One gathers that the Air Staff is gravely concerned about this failure to produce new and improved types of aircraft. There is a story, which is well-founded, that a certainly highly-placed officer recently visited an aerodrome at which he was shown with pride by the technical people a few machines of a new squadron now being formed which is to be equipped with the very latest thing in war machines. He looked at one sample. His sole comment was:—*"Didn't I see that at the 1920 Pageant?"*

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It is said that the question shook the whole technical side of the Air Ministry. A few similar moral disturbances would do a vast amount of good. Our very latest "production" machines are of 1919-20 design and the men who designed these machines are constantly pleading to be allowed to design and produce something very much better.

What hinders them is the constant interference of the so-called technicians at the Air Ministry and at the Royal Aircraft Establishment, hardly any of whom have in fact any technical qualifications whatever beyond what they picked up by rule of thumb during the War 1914-18. And it is always well to remember that if these Air Ministry technicians had any real knowledge or any progressive ideas they would long ago have been bought by commercial aircraft constructors, who could offer them much better pay than they would ever get in a Government Department.

Delays in Contracts.

But there is another department which must be reformed, or at any rate energised, before the R.A.F. can be armed and equipped with the latest products. That is the Contracts Department.

The technical people waste more than enough time in making up their minds what they will approve as fit to become a standard type. And they waste still more time over fiddling little alterations and interferences before they will accept deliveries. But it is "Contracts" who really hang up the orders and prevent the active service people from getting what they want, as well as preventing the Air Council and the Supply Department from spending the money which is allocated for new material.

The Directorate of Equipment, having defeated all technical delays, may requisition for new machines or engines, but the Air Force does not get them because Contracts sit on the actual orders to the constructing firms for anything between six weeks and six months before issuing them. One individual who is likely to know expressed the opinion recently that if the Air Council would make a sudden personal raid on the Contracts Department they would find in the pigeon-holes there requisitions from the equipment people issued to Contracts over six months ago for which contracts have not even now been issued and that they would also find un-issued contracts for machines and parts which have actually been delivered.

Few firms will take the risk of building and delivering aircraft or parts on the mere word of an Air Ministry official. Most commercial people prefer to wait till they receive the actual contracts before they even order the raw material. And it is because contracts for material requisitioned by the Supply branch in March or April only reach the makers in September or October that the goods are not delivered before the end of the financial year and the money has to be returned to the Treasury.

It is along this line of accelerating the production of new and improved aeroplanes that the real increase in strength of the Royal Air Force lies. Mere numbers of men and machines count for little in air war compared with the quality of the men and the efficiency of the machines.

The R.A.E. Puzzle.

One of the standing puzzles of the Air Estimates crops up again in the expenditure on the Royal Aircraft Establishment at Farnborough, formerly known as the Royal Aircraft Factory. The sum shown (under Vote 3, subhead B.) is £40,000, an increase of £4,500 on 1923-24.

But the Salaries (£148,100), Pay (£13,000) and Wages (£138,000) of the personnel (note the nice social distinctions) amount to £299,100. Materials and Stores (£62,000), Machinery (£5,000), Works and Buildings (£22,200) and Miscellaneous (£12,700—including those interesting "non-effective charges") amount to another £101,900. Which brings the grand total to £401,000.

Where the catch comes in is a humble paragraph at the bottom of the column :—"*Deduct*—Cash Expenditure on Production and Experimental Work for which provision is made under subheads A, D, E, F, and G,—£361,000." And when that has been deducted from £401,000 we get the £40,000 which is all that the R.A.E. is shown as costing in the general lay-out of the Estimates.

In reality, then, the R.A.E. is to be paid £361,000 for aeroplanes, engines, spares (A); instruments, photographic equipment and miscellaneous (D); armament and ammunition (E); wireless equipment and electrical equipment (F); and general (metal construction, accessories etc.) (G). And there is not one single aeroplane, engine, instrument, apparatus or gadget ever produced at the R.A.E. which could not have been produced by an appropriate trade firm in a quarter the time at a quarter the cost.

In fact it would be difficult to discover anything used by the R.A.F. which ever originated at the R.A.E. Whereas on the other hand it would be easy to point out a number of things used by the R.A.F. which would have been good if they had been left alone as their designers made them and have been mangled by the R.A.E. till they have become ineffective.

Everything done by the R.A.E. could be done better elsewhere. Research work, both basic and *ad hoc* could be done by the firms themselves in return for payment. Test work could be much better done at Martlesham and Felixstowe, or in the firms' factories under the supervision of the ever-friendly Aeronautical Inspection Department.

Altogether the R.A.E. is a colossal piece of Government extravagance which despite the best efforts of its admirable superintendent and his chief assistants can never be anything except inefficient. It is to be hoped that our Labour Government, always anxious to give employment and to promote efficiency will inquire into the whole principle of the R.A.E. and will ultimately decide on reforming it out of existence

The Helpful A.I.D.

The Aeronautical Inspection Department (Subhead C) is to cost £135,000 against £90,500 in 1923-24. The sum seems moderate considering that it is all for Salaries and Wages (again that social distinction) and that the recipients are responsible for getting full value out of the £6,785,500 which is to be spent on actual purchase of stores and material (apart from salaries, pay and wages of officials). It is a comparatively small insurance policy to pay. Apart from which the lives of all the people who fly depend on the effectiveness with which the A.I.D. does its work.

There was a time when the A.I.D. was unpopular. The Trade hated interference by ignorant A.I.D. officials. And there was more than a suspicion that some of the interference was only a form of black-mail. Certainly during the War 1914-18, there was a certain amout of perfectly plain graft in the A.I.D.

To-day all that is changed. The A.I.D. inspector is generally regarded as the manufacturer's best friend. And in many cases the representations of the practical men of the A.I.D. have accelerated the progress of new machines which were being held up by the stupidities of the "experts" at the Air Ministry. Taking it all round the A.I.D. well deserves its money.

One would like to see the pay of individuals increased rather than an increase in the number of individuals. Inspectors Grade II—the highest shown in the Estimates—only get £650 per annum. Chief Examiners only get up to £500 and Examiners up to £345. It is wrong to pay such low wages to men any one of whom by an error of judgment may easily cost the nation £50,000 and several valuable lives.

The Working Classes.

Another badly paid branch is the Nursing Service. Matrons receive up to £185 per annum, Senior Sisters up to £95, Sisters up to £85, and Staff Nurses up to £65. It is true that they have free board and lodging and presumably kit. But one would have to pay as much for decent parlourmaids and cooks.

Such wages remind one of the reply of the Borough Council to the lady who complained of the incivility of the local dustmen. Below an official type-written letter of regret appeared the manuscript note :—"Madam, you cannot imagine how difficult it is to induce gentlemen to accept appointment to these posts."

It is high tribute to the good which exists in human beings that people can be found who are willing to work conscientiously for such pay. Nursing is not perhaps what it was fifteen or twenty years ago, judged by standards of sympathy and intelligence; but it is still rather wonderful considering the conditions.

The doctors are not so badly paid. Apparently the cheapest of them draw £500 per annum. Which is quite as much as many of them are worth. And they have a sporting chance of rising to £1,000 per annum.

Buildings and Education.

There is little need to go into details of Vote 4. (Lands and Buildings), Vote 6. (Educational Services) or Vote 7. (Auxiliary and Reserve Forces)

Lands and buildings are a much abused branch but they do much good work. A study of the Estimates show the improvements which are being made.

Calshot is having a new slipway. Felixstowe is spending £15,000 on accommodation for the Marine and Armament Experimental Establishment. Gosport is building a new shed for £25,000. Lee-on-Solent is having new Officers' Quarters. Leuchars is having a new pump.

An ammunition depot is being built at Altrincham. Work of various sorts is in progress at Biggin Hill, Bircham-Newton, Catterick, Digby, Duxford, Filton, Flower Down, Harlescott, Hawkinge, Henlow, Kenley, Martlesham, Manston, Netheravon, Northolt, Old Sarum, Shotwick, Spittlegate, Tangmere, Upavon, Uxbridge, Worthy Down and Wittering. From which it may be judged that these stations are of growing importance.

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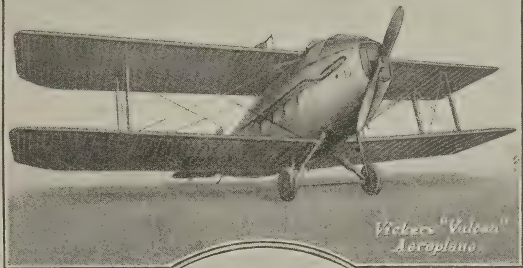

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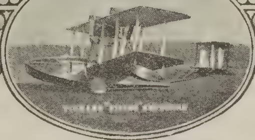

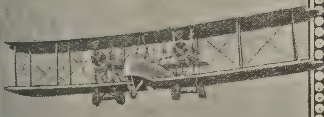

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increasing the buildings and accommodation at Halton. As this is the training centre for Aircraft Apprentices, it seems to be money well spent. £410,000 is being spent on quarters for married officers and £920,000 in quarters for married Airmen in Home Stations generally, which will be good news to many uncomfortable married couples.

Some hundreds of thousands of pounds are being spent on works in Egypt, Palestine, Trans-Jordania and Iraq,—£488,000 at Hinaidi alone. Which suggests that we intend to stay there despite the Lords Rotherbrook and Beavermere.

The total cost of the Staff College at Andover is put down at £13,200. The Cadet College at Cranwell costs £186,500. The school of Technical Training (Boys) at Halton costs £251,300. General and Vocational and Miscellaneous Education costs £46,500.

Civil Aviation.

Civil Aviation is to cost £355,000 in all against £287,000 in 1923-24. This includes £137,000 for subsidies against £205,000 in 1923-24. So the Imperial Air Transport Co. with its promised Million Pound Subsidy is to work out cheaper than the old Go-as-you-please and Catch-as-catch-can system.

Aerodromes are allotted £36,000 for Salaries and Wages, Aerial routes and surveys absorb £34,000. This includes £15,000 for "Operational Experiments," a grant which did not appear last year

The chief increase is £119,700 for Works and Buildings. The biggest single item is £29,500 for "The Diversion of Public Road." This presumably means closing Plough Lane, which has for long been so much used for the diversion of the public on show days at Croydon that it has on such occasions been less of a road than a free grand-stand. The intention is, one believes, to join the present aerodrome to the disused aerodrome on the other side of the road and leave the aerodrome buildings as an island site in the middle, one side being the arrival platform and the other the departure platform. Which is not a bad scheme until we can land in Hyde Park or on the roof of the projected Pimlico Palace at Victoria.

The Meteorological Department gets £900 extra this year. The Air Ministry docks itself of £17,000 for telegraphic and telephonic charges. And £2,000 is deducted from Allowances to Civil Medical Practitioners and Ministers of Religion.

Taking them all round the Air Estimates are entertaining and instructive to those who take the trouble to study them, and a considerable amount of quiet amusement can be derived from many of the details. The Nation's money seems to be well and carefully allocated and critics will find it difficult to cavil at the proposed expenditure. Where criticism is needed is rather to stir up individual chiefs of departments and of sub-departments to move more quickly and spend the money which has been allotted to them.

THE HOUSE OF LORDS ON THE AIR FORCE.

On March 4 the affairs of the Air Force were discussed in the House of Lords when the **Marquess of Londonderry** put down a motion identical with that moved by Sir Samuel Hoare in the House of Commons on Feb. 19.

Lord Londonderry's arguments were precisely those used by the Conservatives in the House of Commons. He lamented the decline of the Air Force since the Armistice. He insisted that the proposed increase was not aimed against France. He mourned the pacifism of the Government and the insufficiency of the Air Force.

Three passages in his speech specially deserve quotation as indicating sound basic principles on which to build our Air Power. These are as follows :—

> (A) You must have continuity in the development of your air designs. You must keep your commercial aviation in being; but we must recognise that aircraft designers and manufacturers must also be maintained, because civil aviation is an insufficient reservoir for the development of an Air Force.
>
> (B) The policy initiated by Sir Samuel Hoare, Secretary of State for Air in the late Government, was no hastily devised scheme. It was the agreed policy not only of the Government and of the Committee of Imperial Defence, but it was a policy to which the members of the Imperial Conference gave their most decided adherence.. It was designed to ensure that we should have a bare minimum of power in the air, which would suffice to place us in a position of comparative security
>
> (C) The value of an Air Force must be measured by the strength of its Independent Air Organisation. We must have aeroplanes to assist the Navy and aeroplanes to co-operate with the Army, but the effective strength of a country in the air must be measured and determined by the size and efficiency of its Independent Air Force.

The Duke of Sutherland, Under-Secretary for Air under Sir Samuel Hoare, in supporting the Resolution, attacked the Government representatives more directly. He quoted Mr. Leach as saying in a speech at Bradford :—

> Lord Haig's duty had been to kill, lay waste, destroy and make widows and orphans and to add enormously to the miseries of the world. Lord Haig, together with Foch, Hindenberg and Ludendorff, played a leading part in the greatest and bloodiest swindle in the world's history.

The Duke added sarcastically :—

> Londoners can sleep soundly in their beds and no bomb will ever drop from the sky while Mr. Leach is in the saddle to intercede for us, or if a bomb or two do drop by some extraordinary mischance, and we have no Air Force at all to prevent it, the British public must not be annoyed or even perturbed, provided they have a righteous cause.

Then turning to Lord Thomson he held him up as having distinctly hostile military feelings towards France. He quoted the words of Lord Thomson as they appeared in an article in an American magazine, the "Nation," published on Jan. 30, 1924, in which the present Air Minister wrote :—

> To them (the French) glory and conquest are of more importance than any markets. They want money and believe they can obtain it at the point of the bayonet. . Though trade is to them a secondary consideration they do not forget it, but they think it will follow the flag
>
> Perhaps the answer to the questions put above is that the French Government will go on bullying a disarmed and helpless Germany as long as the world lets her and until the German people can save themselves, but that the moment they are resolutely tackled and made to face facts the French people will force their Government to be more circumspect.
>
> Firmness is needed as well as a desire for peace. The French Government should be made to understand that in the last resort force can be met by force. If, through the efforts of other States, German industry is freed from the trammels put upon it by French vengeance, common equity demands that the industries of other nations should have an equally good start.

After which the Duke of Sutherland said :—

> We have the spectacle, therefore, of a Secretary of State for Air breathing fire and slaughter against France on Jan. 30, and his Under-Secretary of State dispensing pious texts on Feb. 19. Whether the lion or the lamb will ultimately triumph in the quest of the Holy Grail one cannot say.

Thereafter the Duke repeated the best of the arguments used in the House of Commons on the Conservative side.

Lord Gorell, Under-Secretary of State for Air under Captain Guest, said that Mr. Leach's speech was not so unsatisfactory as it might seem as he stated quite distinctly that there was to be no change in the policy of the Government. He failed to see why there should be so much criticism of Mr. Leach's phrase, "the only adequate defence that I can see is a changed international atmosphere." Nobody knew what was actually implied by the word "adequate" in relation to home defence. He agreed with Lord Grey's statement in July last year that a race in air armaments would be far more deadly than in the case of naval armaments. He suggested that the limitation of air armaments was one of the things which the world as a whole must take definitely and immediately into consideration.

Lord Thomson, Secretary of State for Air, in replying objected to the Duke of Sutherland's extracts from his article. Though it was published on Jan. 30 after he had become a Minister of the Crown, it had been written on Christmas Day when he was not. Speaking as a General Staff officer he asked who could say, with the development of flight, what Power would be in ten years the strongest Power within striking distance of our shores. He said he could see officers of the General Staff spending years arguing as to what was a sufficient force to give adequate protection.

He pointed out that some of the most vehement advocates of increasing the Air Force were members of the Government under whom the Air Force was reduced. He did not suppose any out-and-out pacifist would have done much more in the way of reduction. Lord Londonderry was partly responsible for the reduction in our air armament and the Duke of Sutherland had carried out part of the salvage operations. Referring to Sir Samuel Hoare he said that he pulled the aeroplane of State as one might say out of a sort of spinning nose dive and stopped the drop in our armaments.

Personally he did not believe in any immediate danger and asked why it should be more serious five years hence than it is to-day.

As to home defence he suggested that the Trade Union leaders in the Labour Party knew all about what might be called the home front and did not forget the air raids in the War. They remembered that the first Victoria Cross gained within the British Isles was won in the air and they were aware of the power of certain organs of the Press hostile to them in the way of causing scares and panics. They knew perfectly well that the people of this country would never justify a Government which neglected to take proper precautions against a repetition of the horrors of the air raids.

On the subject of pacifists he said :—

> I often wonder what a pacifist is. Most thinking men and women are pacifists in deploring the folly and insanity of war and its futility. I know a good many pacifists who, when it is a case of redressing

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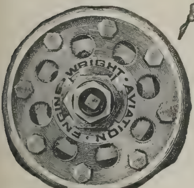
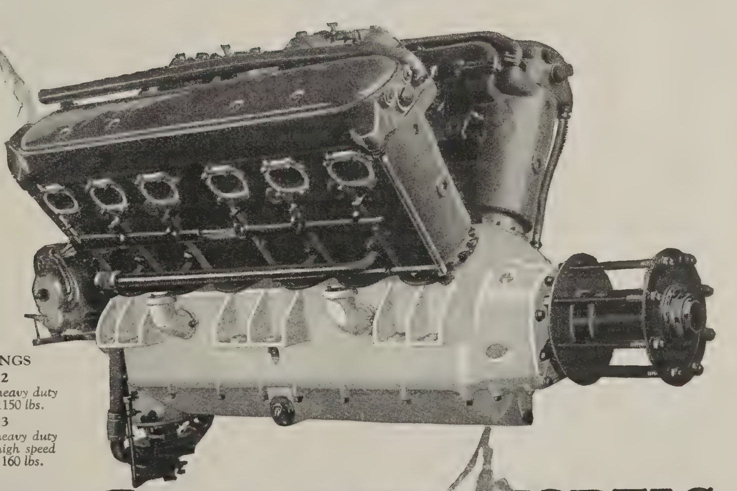


The Wright heavy duty T engine installed in a U. S. Navy torpedo plane increased the power by about 150 H.P. This increased the service ceiling almost 90%, the rate of climb and take off 30% and the high speed over 10 miles per hour. The flight radius remained practically the same but the flying characteristics were greatly improved due to the reserve power.



RATINGS
T-2
525 H. P. heavy duty
Weight 1150 lbs.
T-3
550 H. P. heavy duty
650 H. P. high speed
Weight 1160 lbs.

WRIGHT ENGINES MODELS T

wrong or making war upon the heathen, display a quite suspicious military ardour.

Nothing is easier to get than a label. I was once myself addressed as a "blooming pacifist" by a Bristol docker. I do not know why I should be called a pacifist. I have served in five wars. I have done very well out of them, you may say. I have had interesting work all the time, but I do think they are futile and insane and utterly wasteful. Up to that point I am a pacifist. One hardly does justice to the working men of this country in calling them pacifists.

On the Air Force itself he said :—

I have inherited an enthralling task; the direction of a Service built up in the war years by an immense expenditure of blood and treasure, with a splendid record of heroism and self-sacrifice. The machine exists, it functions admirably. Its activities include defence, research, and the fostering of every form of aviation. It is manned by enthusiasts who are always seeking for new developments and new ideas. It is essentially a national service and it will become, as time goes on, a vital factor in the national life."

As to the Government's policy he said :—

Your Lordships may rest assured that the scheme of home defence as initiated by the Coalition Government in 1922, and amplified by the late Government, will be continued without any interference with the administration as it existed when we came into Office. On the contrary, measures will, I trust, be taken to speed up research and civil aviation.

The Auxiliary Air Force and Air Force Reserve Bill is in the list of essential Bills of great urgency that will shortly be submitted to Parliament. The scheme will be worked out in definite stages, but without any break in the continuity of the policy. I stress the reference to stages, and I have no doubt that it may arouse some misgivings, but I do so because, if some such Conference as that held recently at Washington should provide for an all-round reduction of armaments, we might be able, and we should be eager, to take full advantage of its provisions

In regard to civil aviation our aim is equally distinct. My ambition is to encourage the air habit in this country for several reasons. In the first place I put defence. Just as our Navy looks to the mercantile marine for its natural reserve in time of war, so, now that the sea no longer affords the same protection as it did ten years ago and the main menace to our security is from the air, we must build upon our mercantile air reserve, consisting of men who can think and act in three dimensions."

As to idealism and policy Lord Thomson said :—

In a recent debate we have been reproached for our idealism. There have been sneering references to the Sermon on the Mount. I do not suppose that any of your Lordships would care to blight the flower of idealism provided its roots were in the soil of common sense. I have tried to point out that our policy is a common-sense one, and I have been at pains to show that it is a direct continuation of the policy of our predecessors.

In my own mind I compare common sense and idealism with two things which we used to study as staff officers—with strategy and policy, which we were taught should always be in harmony and go hand in hand.

Referring to the Resolution he said :—

If it were carried to its logical conclusion, we and the other States of Europe would rattle into bankruptcy as well as barbarism We are determined to give a fair trial to another method; to pursue another line of thought. The task is difficult, no doubt. Much patience will be required and innumerable obstacles will have to be overcome. A year hence our ideas may have to be revised. We may have to admit failure. In the meantime, I have given your Lordships a rough outline of what we propose to do, and we believe that this endeavour is not only higher and more civilised, but that it is infinitely more practical than the alternative presented to us—namely, that of embarking upon a race of armaments.

The Marquess of Salisbury referring to Lord Thomson's article in the "Nation" said :—

You do not part entirely with your past when you become a Minister, but are responsible, at any rate to a limited extent, for what you may have said only about two months ago.

He chaffed the Air Minister about "the earnest gentlemen among the electorate who thought they were electing a pacifist Government," and he quoted the Viscount Haldane, the present Lord Chancellor, as saying that the command of the air was necessary so far as home defence was concerned. Afterwards Lord Salisbury repeated all the usual arguments about France and our having ceased to be an island

The Lord Chancellor, the Viscount Haldane, said that at this moment the Government was doing its best to make better, friendlier and more genial relations with France. They objected to the Resolution not because of its substance but because of its form. He recalled the old song, "We don't want to fight, but by Jingo if we do," which was sung in the streets when he was young. He said that he always had a good deal of sympathy with the substance of that song but he objected to its being sung in the streets then and he should object to it being sung in the streets now. He had had the privilege of being consulted by the late Government about the form of their Air Force and he entirely approved of the details. Further he said :—

It is not only for home defence that an Air Force is required. It is required ten times as much, and is ten times as likely to be used, in three or four places which I could specify were it desirable to do so. The problem of the Air Force is a very much larger one than any of which the Resolution before us to-day forms a solution. The work of building it up must go slowly; it cannot go quickly.

The Marquess Curzon of Kedleston welcomed the better atmosphere into which our relations with France appear to be passing.

The Earl of Beauchamp also questioned the meaning of the phrase "adequate defence."

On the question being put the motion was agreed.

THE ROYAL AIR FORCE.

London Gazette.

Mar. 4.

General Duties Branch.—The follg. Flt. Lts. are granted permanent commns. in the ranks stated (Mar. 5):—R. H. G. Neville, M.C., F. Wright.

H. C. Lee is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, Feb. 20; Plt. Off. T. A. Verney-Cave is promoted to the rank of Flg. Off. (Dec. 11, 1923); Flg. Off. D. Maclaren resigns his S.S. commn. and is permitted to retain his rank (Mar. 5).

The follg. are restored to full pay from half-pay :—Air Commodore L. E. O. Charlton, C.B., C.M.G., D.S.O. (Mar. 7); Flt. Lt. C. L. King, M.C., D.F.C. (Feb. 25).

Stores Branch.—C. E. Norris, O.B.E. (Capt. I.A.R.O.) is granted a S.S. commn. as a Flt. Lt. for three years on the active list, with seny. of Oct. 24, 1922 (Jan. 28).

The follg. are transferred to the Stores Branch on probation from the General Duties Branch (Dec 10, 1923) :—Flg. Offs.—P. H. Burt, W. T. Lewis, G. Scarrott, E. A. Burridge, J. Davison. Plt. Offs.—C. W. Gore, M. W. Keey.

Medical Branch.—R. H. Stanbridge is granted a S.S. commn. as a Flg Off., with effect from, and with seny of, Feb 19; Flt. Lt. J. C. T. Fiddes, M.B., is transferred to the Reserve, Class D.2 (March 6).

Reserve of Air Force Officers.—The follg. offs. are confirmed in rank, with effect from dates indicated :—Flg. Offs.—E. A. Cherry, J. L. Mayer, D.F.C. (Feb. 8); H. V. Barker, F. W. Hartridge, A.F.C., R. D. Leigh-Pemberton, M.C. (Feb. 9); W. B. Kelly, R. W. Reeve, D.F.C., M.M. (Feb. 28); W. H. Farrow, D.F.C. (Mar. 4). Plt. Offs.—A. Cairnie (Feb. 16); J. P. Crawford, L. R. Robertson (Feb. 19); L. Motley (Feb. 20); R. T. Bark (Feb. 27).

Appointments.

Week ending Mar. 10.

General Duties Branch.—Wing Commander R. C. M. Pink, C.B.E., to No. 2 Wing H.Q., India, to command, instead of to No. 1 Wing H.Q., as previously notified, 23/11.

Squadron Leaders A. R. Arnold, D.S.C., D.F.C., to H.Q., Iraq, 22/2; R. L. G. Marix, D.S.O., to Air Ministry, 15/1.

Flight Lieutenants E. P. Hardman, D.F.C., to R.A.F. Depot on transfer to Home Estab., 29/11; B. E. Baker, D.S.O., M.C., A.F.C., to Aden Flight, 19/2; A. M. Blake, A.F.C., to Egyptian Group H.Q., 23/2; G. C. Gardiner, D.F.C., to No. 2 F.T.S., Duxford, 1/3; A. H. Beach, to No. 5 F.T.S., Shotwick, 1/3

Flying Officers E. M. Milling, A. Jerrard, V.C., and C. S. Riccard, to No. 5 F.T.S., Shotwick, 1/3; G. S. L. Hayward, M.C., and D. P. Hadow, M.C., to No. 2 F.T.S., Duxford, 1/3; J. B. Allen, to R.A.F. Cadet College, Cranwell, 1/3; T. MacM. Shields, D.F.C., and K. H. Holley, to No. 24 Sqdn., Kenley, 1/3; J. N. Boothman and R. H. Stocken, to C.F.S., Upavon, 1/3; F. Beesley and W. L. Dawson, to No. 1 F.T.S., Netheravon, 1/3; G. W. Birkinshaw, to No. 25 Sqdn., Hawkinge, 13/3; W. G. Kentfield, to I.A.A.D., Henlow, 24/3 D. S. Buchanan, to R.A.F. Depot (Non-effective Pool), 1/3; A. E. Reynolds, to No. 25 Sqdn., Hawkinge, 10/3; R. F. Casey, D.F.C., to Aircraft Depot, India, 8/2.

Pilot Officers R. E. Bain, to No. 1 F.T.S., Netheravon, 1/3; R. S Blucke, to R.A.F. Cadet College, Cranwell, 1/3.

Medical Branch.—Flight Lieutenants (Medical) P. C. Livingston, D.P.H., D.O.M. & S., to R.A.F. Central Hospital, Finchley, 17/3; T. J. X. Canton, M.B., to R.A.F. Depot, on transfer to Home Estab., 17/2; T. A. G. Hudson, B.A., to Marine and Arm Exper. Estab., Felixstowe, 14/3. Flying Officer (Medical) R. W. White, to R.A.F. Hospital, Cranwell, 19/3. Flying Officer (Q.Mstr., Medical) F. W. Goodread to R.A.F. Central Hospital, Finchley, 20/3.

Store and Accountant Branch.—Flight Lieutenant (Stores) C. E. Cullen, to No. 1 Group H.Q., Kenley, 10/3; Flying Officers (Stores) J McCarthy, to Stores Depot, Iraq, 27/1; L. T. Sanderson, D.S.M., to Aircraft Depot, Iraq, 8/2.

An Investiture.

H.M. the King held an Investiture at Buckingham Palace on Mar. 6.

Among those in attendance upon His Majesty was Air Chief Marshal Sir H. M. Trenchard, Bt., Principal Air Aide-de-Camp, Group Capt. C. L. N. Newall, R.A.F., Aide-de-Camp in waiting, was also present.

The following officers of the R.A.F. were introduced into the presence of the Sovereign, when the King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted :—

THE MOST HONOURABLE ORDER OF THE BATH (MILITARY DIVISION).—Knight Grand Cross :—Air Chief Marshal Sir Hugh TRENCHARD, Bt.

Companion (Military Division) :—Air Commodore David MUNRO.

THE MOST DISTINGUISHED ORDER OF SAINT MICHAEL AND SAINT GEORGE.—Companion :—Sir Harry BRITTAIN, M.P.

Wing-Commander Louis Greig.

It is announced in the *London Gazette* that the King has appointed Wing Commander Louis Greig, C.V.O., to be a Gentleman Usher in Ordinary to His Majesty, and that the

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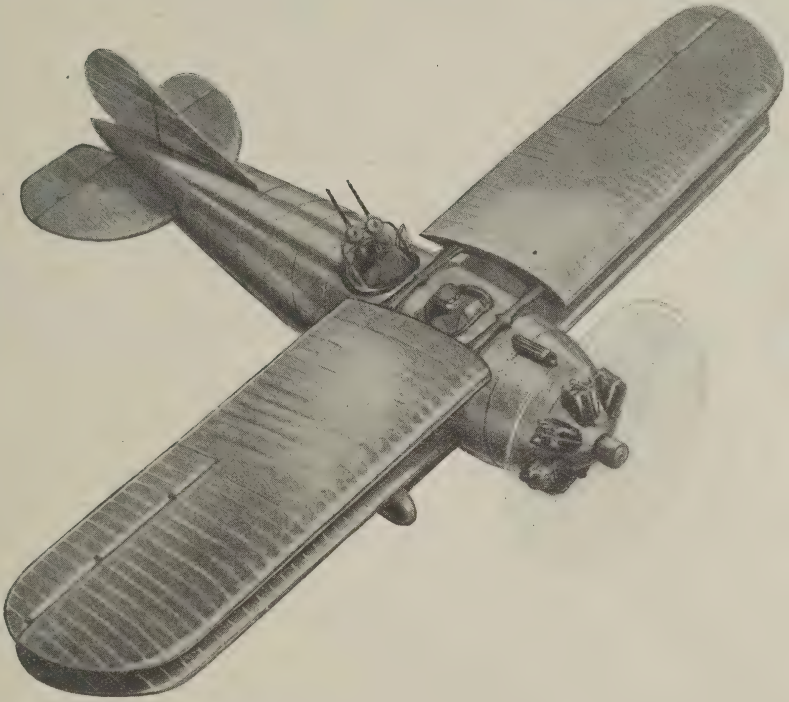

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

SHORT BROS.

(ROCHESTER & BEDFORD) LTD,

WHITEHALL HOUSE, 29-30, CHARING CROSS, LONDON, S.W.1.

Duke of York has appointed Captain Basil Vernon Brooke, C.V.O., R.N. (Retired), to be Comptroller and Equerry to His Royal Highness, in the room of Wing Commander Greig, resigned.

THE R.A.F. SPORTS BULLETIN.

(Issued in Collaboration with the R.A.F. Sports Bulletin.)

The Amateur Foil Championship.

For the first time the Amateur Foil Championship has been won by a Royal Air Force Officer. The congratulations of the R.A.F. Sports Board are accorded to Flt. Lt. F. G. Sherriff on his meritorious and thoroughly deserved victory in winning the 22nd Annual Championship at Bertrand's Academy on Mar. 7.

Flt. Lt. Sherriff has always been a keen fencer and the way in which he has worked up to the highest honours deserves the greatest praise and credit.

Fencing.

R.A.F. v. OXFORD UNIVERSITY :—Oxford University sent a team of three to contest a two-weapon match against the R.A.F. at Uxbridge last week but the trio did not represent the Dark Blues' real strength, and the R.A.F. won both events, the Foils by seven victories to two, and the Epée by eight victories to one. The teams were :—

Foils.—R.A.F. : Flt. Lt. Sherriff, Sjt.-Maj. Stollery, and Sjt. Scott. Oxford University : E. Hugh Jones (New College), G. Rink (University), and M. A. Thorpe (New College).

Epée.—R.A.F. : Flt. Lt. Sherriff, Sjt.-Maj. Stollery, and Cpl. Hay. Oxford University : Hugh Jones, G. Rink, and M. A. Thorpe.

The R.A.F. Boxing Championships.

The R.A.F. team championships were fought at the Guildhall, Winchester, on Feb. 21 and 22. Teams of eight boxers from the various stations competed for two challenge cups. Five teams entered for the Officers' weights and eight for the Other Ranks.

The results were—

OFFICERS' CHALLENGE CUP.

Bantam-weight.—Final.—Flg. Off. Gill (Kenley) beat Flg. Off. A. J. M. Moss (Andover) on points.

Feather-weight.—Final.—Flg. Off O'Brien-Saint (Andover) beat Flg. Off. E. M. Ling (Halton) in the first round.

Middle-weight.—Final.—Flg. Off Baxter (Spittlegate) beat Flg. Off. E J. Hope (Lee-on-Solent) in an extra round.

OTHER RANKS' CHALLENGE CUP.

Fly-weights.—First Series.—AC.2 May (Kenley) beat AC. Small (Henlow) in the third round; AC. Ward (Andover) beat AC. Clarke (Lee-on-Solent) on points; AC. Turner (Uxbridge) beat AC.1. Harrington (Spittlegate) on points.

A Bye.—Cpl. Alexander (Halton).

Bantam-weights.—.—First Series.—AC. Bridges (Andover) beat AC. Jonas (Uxbridge) on points; AC.2. Towner (Kenley) beat AC. Morley (Lee-on-Solent) on points; L-AC. Williamson (Henlow) beat AC. Codling (Halton) on points.

A Bye.—AC.2. Goldring (Cranwell).

Feather-weights.—First Series.—AC.2 Roberts (Kenley) beat L-AC. Wyatt (Cranwell) on points; AC.1. Kinsman (Andover) beat AC. Woods (Henlow) in the first round; L-AC. Proctor (Spittlegate) beat AC.2. Richardson (Lee-on-Solent) on points; AC. Gibbin (Halton) beat AC. Tatum (Uxbridge) on points.

Light-weights.—First Series.—L-AC. Griggs (Henlow) beat Corporal Abbott (Uxbridge), who retired injured in the second round; Sjt. Stone (Andover) beat AC.1. Williams (Cranwell) in the second round.

Byes.—Sjt. Salter (Halton) and AC 1. Fanner (Kenley).

Welter-weights.—First Series.—AC. Ballantyne (Andover) beat AC.2. Hooker (Kenley) in the first round; Cpl. Broadway (Uxbridge) beat AC.2. Willows (Lee-on-Solent) on points; AC. Page (Halton) beat AC.1. Ralph (Spittlegate) on points; L-AC. Jenkinson (Cranwell) beat AC. Tate (Henlow) on points.

Middle-weights.—First Series.—Cpl. Finnie (Andover) beat L-AC. Reeves (Cranwell) in the first round; AC. Rollason (Halton) beat AC.2. Howe (Spittlegate) on points; AC.1. Bailey (Lee-on-Solent) beat L-AC. Wood (Henlow) on points; AC.2. Marshall (Kenley) beat Cpl. Eyles (Uxbridge) in the second round.

Light Heavy-weights.—First Series.—AC. Egginton (Halton) beat AC.2. Rudder (Kenley) in the first round; AC.1. Steele (Henlow) beat AC.2. Barnard (Spittlegate) in the first round; L-AC. Gallimore (Lee-on-Solent) beat L-AC. Doran (Cranwell) in the third round; L-AC. Fisher (Andover) beat Cpl. Edwards (Uxbridge) in the first round.

Fly-weights.—Semi-Final.—AC. May (Kenley) beat Cpl. Alexander (Halton) on points; AC. Ward (Andover) beat AC. Turner (Uxbridge) on points.

Bantam-weights.—Semi-Final.—AC. Bridge (Andover) beat AC. Goldring (Cranwell) on points; L-AC. Williamson (Henlow) beat AC. Towner (Kenley) in the third round.

Feather-weights.—Semi-Final.—AC. Roberts (Kenley) beat AC. Kinsman (Andover) on points; AC. Giblin (Halton) w.o., AC. Procter (Spittlegate) retired owing to injuries.

Middle-weights.—Semi-Final.—Cpl Fifiney (Andover) beat AC. Rollason (Halton) on points; AC. Marshall (Kenley) beat AC. Bailey (Lee-on-Solent) in the third round.

Light Heavy-weights.—Semi-Final.—AC Egginton (Halton) beat AC. Steele (Henlow) on points; L-AC. Fisher (Andover) beat AC. Gallimore (Lee-on-Solent) in the third round.

Catch-weights.—Sjt. Thompson (Cranwell) beat Cpl. Cleeve (Henlow) in the second round; Cpl. Barrett (Halton) beat AC. Lockett (Andover) in the first round.

Rugby Football.

(Unofficial.)

R.A.F. v. ARMY.—In the presence of Air Chief Marshal Sir Hugh Trenchard and most of the senior officers of the Home Establishment of the R.A.F. the Royal Air Force beat the Army at Uxbridge on Mar. 8 by a goal and a penalty goal (8 points) to a try (3 points). The match was exceptionally hard-fought even for Service Rugger.

The Air Force kicked off into the sun and against a slight wind and within two minutes a break-away by Sq. Ldr. Russell followed by a scrimmage near the Army line and Flt. Lt. Chick went over for a try which was converted by Flt. Lt. Usher. This shook the Army and for twenty-five minutes the battle raged up and down the ground with honours practically even. The Air Force had perhaps the better of the game in the scrum at this stage.

Aided by a free kick against the R.A.F. for feet-up the Army got dangerously near the line and a long pass by their inside right sent Lt. Bryan over far out. The place kick from an awkward angle failed. Once again the Army fought their way into the home twenty-five after a great burst of speed on their left wing and getting the ball out of the scrum which followed the tackling of Lt. Thomas, an Army back was within a few feet of the line when L-AC. Collins brought him down and smothered an almost certain try with deadly accuracy. Shortly after this Flt. Lt. Usher kicked a beautiful goal from a penalty at 40 yards.

There was no further scoring although late in the second half after a clever passing movement Flt. Lt. Chick crossed the line only to be recalled owing to a forward pass. The second half was as fast as the first and the Army had very bad luck in losing Lt. Faithfull, who had to retire hurt.

The Air Force forwards have never been better. Their team work both scrimmaging and in the loose was magnificent. Although an Army supporter was heard to say hopefully, "I'm just waiting for your forwards to crack; they can't last the pace," there was no sign of cracking and they never even slackened their efforts to the bitter end.

The three-quarter line, lacking the speed and handling power of their opponents, played a defensive game. Their tackling was amazing and the Army three-quarters who played havoc with the Navy defence at Twickenham a week earlier, never really got into their stride. Flt. Lt. Bryson was particularly active in this respect and in addition to tackling on his own wing on several occasions came right across and saved an awkward situation on the left wing. He went very straight and very low and never missed.

The real hero of the day was Sq. Ldr. Russell who not only played a brilliant individual game at scrum half but was also an inspired leader. He worked the scrum with faultless energy and while some of his movements were unorthodox enough to confuse his opponents he was always in close touch with his own backs. His fierce breaks-through and resourceful kicking gained ground again and again.

The R.A.F. team were :—

The Rev. J. G. Stephens (Cranwell), back; Flt. Lt. C. B. Riddle (Gosport), Flt. Lt O. Bryson (Cranwell), Flg. Off. P. J. Chambers (Kenley), and Cpl. A. M. Wale (Flowerdown), three-quarter backs; Flt. Lt. C. Medhurst (Air Ministry) and Sq. Ldr. J. C. Russell (Andover), half-backs; Flt. Lt. R. H. Usher (Northolt), Flg Off. C. D. Adams (Netheravon), Flt. Lt. J. S. Chick (Farnborough), Flg. Off. T. Rose (Netheravon), Flg. Off. F. Isaac (Cattewater), Flg. Off. F. W. Sinclair (Farnborough), Flg. Off. E. C. Wackett (Netheravon), and L/AC. S. G. Collins (Duxford), forwards.

No. 46 Squadron Dinner.

No. 46 Squadron, R.F.C. and R.A.F., will hold its 7th Annual Dinner this year on Apr. 5 at the Blenheim Rooms, Hotel Cecil, 7 for 7.30. Tickets 25s. each inclusive of wine.

All members who wish to attend should communicate with C. J. Marchant, 10, Bush Lane, Cannon Street, E.C.4., at the earliest opportunity.

55's Dinner.

55 Squadron R.A.F. held its annual dinner at the R.A.F. Club on Saturday with Squadron Leader Nicholas in the chair. Some forty members of this famous squadron were present, including Squadron Leaders Alex. Gray, Hazell, Gaskell-Blackburn, and Maxwell. It was particularly interesting to notice that whereas two years ago the company at dinner consisted of the personnel of the original 55 who had served with the Independent Force R.A.F.. in France, with one solitary representative of the existing 55 Squadron in Mesopotamia, this year the great majority of those present were Mesopotamians—including the whole of "B" Flight as it existed under Flt. Lieut. Maxwell. The observers Union of old 55 in France was as usual ably represented by its founder and president.

Unfortunately the founder of the Squadron, Wing-Commander Baldwin, and all its other C.O.s (all of whom are, so far as one can gather, still alive and doing well in the Air Force) are serving overseas. A cable of good wishes was received from the squadron at Mosul and a telegram of regret for inability to attend came from "Two Insolvent Officers at Duxford." The guests of the evening were Capt. Marson of the Air Ministry and Sq. Ldr. Bowman, whose squadron in Iraq (No. 6) had so often and so long co-operated there with 55.

Altogether it was a good show and it is so hoped that all old 55s within reach will attend the next re-union. Communications should be sent to Sq. Ldr. C. H. Nicholas, D.F.C., A.F.C., R.A.F., Martlesham Heath

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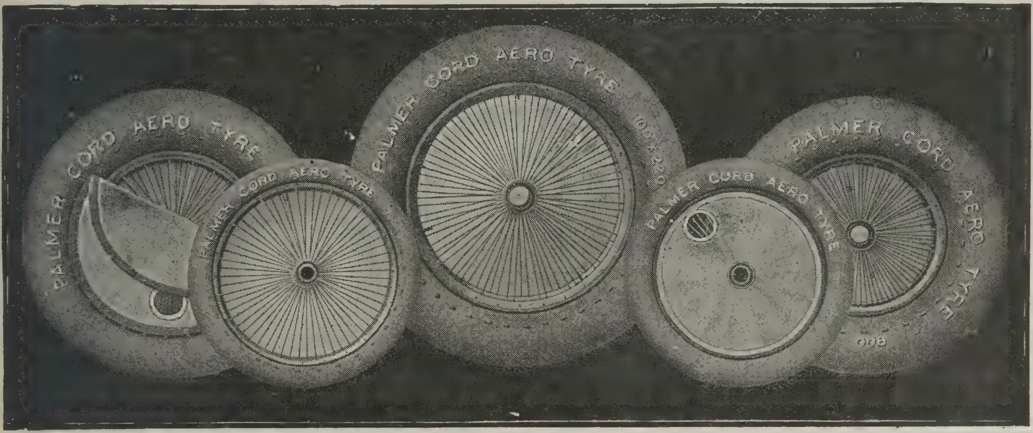

STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	36*	185.	55.	135/50
,,	40*	185.	60.32	135/50
,,	152	185.	66.67	135/50
,,	163*	185.	66.67	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60
,,	141	250.	80.	Central
,,	201	185.	60.32	125/60
1000×150	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
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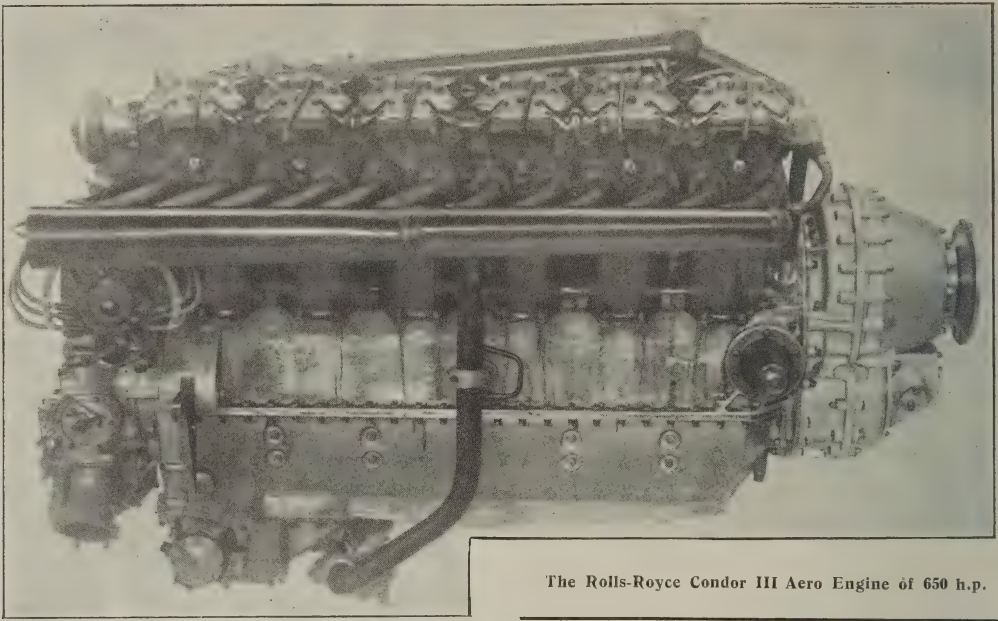
THE ROLLS-ROYCE CONDOR III AERO ENGINE.

BY W. H. SAYERS.



The Rolls-Royce Condor III Aero Engine of 650 h.p.

At the invitation of Rolls-Royce Ltd. the writer recently visited the works at Derby and saw the processes of manufacture which result in the production of the Rolls-Royce Condor Series III aero engine, and the engine itself both in parts and assembled. As is probably well known the Condor type of engine was originally designed towards the end of the war very largely to meet the need for an engine having the same quality of reliability as had been displayed by the Rolls-Royce Falcon and Eagle types but of considerably greater power. The primary use to which it was intended to devote this type was the equipment of large, sea-going aircraft for Fleet co-operation purposes.

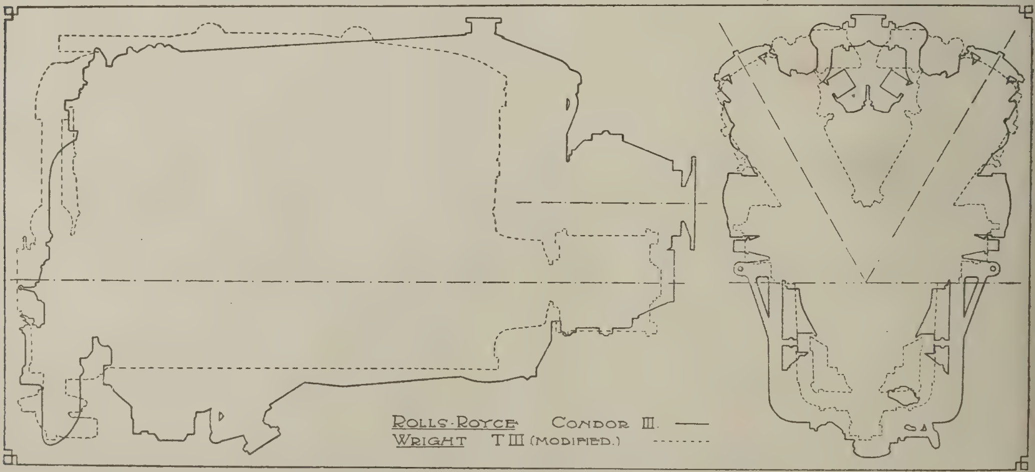
Aircraft intended to utilise the Condor had been designed and almost completed by the time of the Armistice but work on both the aircraft and on the Condor engine was naturally retarded by the advent of peace.

The original Condor engine followed very closely the design of the smaller Falcon and Eagle types of Rolls-Royce engine on an enlarged scale. The engine was designed to develop 550/600 h.p. instead of the 370 h.p. of the later Eagle engines, and the only notable apparent difference was in the provision of four valves per cylinder in place of the two valves which sufficed for the smaller types. It is understood that only a few of the original Condor Series I were produced, but it is known that these few showed that they possessed the characteristic reliability of the earlier types.

The Series I type was succeeded by the Series Ia in which by detail modifications and alterations the normal output at 1,900 r.p.m. was raised to 650 h.p. This engine gave an extremely good account of itself. It has been fitted to the Short Cromarty, Vickers Valentia, and Fairey N.4 type flying boats, to the Avro Aldershot bomber, and to a number of other noteworthy modern aircraft.

More recently this type has been superseded by the Condor Series III still of the same general design, developing a normal B.H.P. of 650 at 1,900 r.p.m., but weighing nearly 300 lbs. less than the earlier type

The constructors of certain modern American aero engines have quite deservedly taken unto themselves credit for having produced engines of high power, low weight and extremely small frontal area which have permitted the attainment of hitherto unparalleled speeds on American racing aeroplanes. It may be pointed out that the Condor type III has been produced solely for use on heavy military machines. Despite this fact the outline drawing which is here reproduced shows that in the matter both of frontal area and of overall dimen-



Outline of the Rolls-Royce Condor III engine of 650 h.p. superimposed on that of the Wright T.3 engine of 575/675 h.p.

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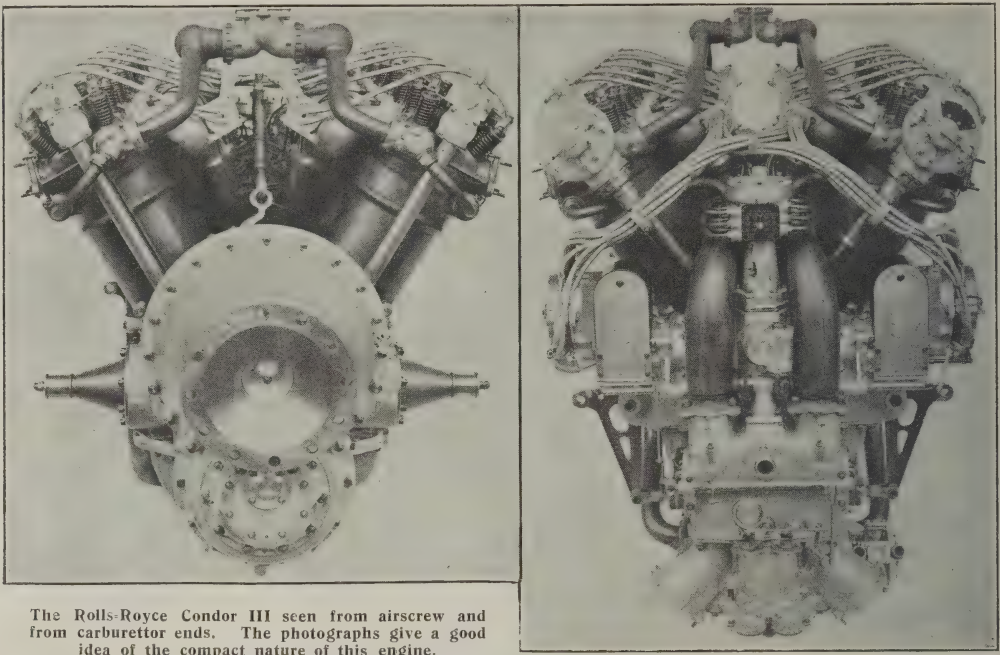

The Rolls-Royce Condor III seen from airscrew and from carburettor ends. The photographs give a good idea of the compact nature of this engine.

sions the Condor III compares very favourably with the Wright T.3 which is the nearest American racing engine in point of power.

In making this comparison it is to be borne in mind that the Condor outline shown embraces not only a reduction gear which is not fitted to the Wright engine and which would be omitted from a racing Condor, but also includes the outline of standard water piping, and many other details which will doubtless be compressed into a somewhat more compact form when the engine is adapted to a racing machine.

Also whereas the Wright T.3 is called a 675 h.p. and the Condor only a 650 h.p. unit, this Wright rating is a rating for the purposes of high-speed light aircraft and the Condor rating is a heavy duty rating. Actually the Wright T.3 is rated at only 575 h.p. for heavy service comparable to that for which the Condor III is destined and the standard Condor III actually develops between 710 and 720 h.p. at 2,100 r.p.m An ungeared Condor to operate under conditions similar to those in which the Wright engine develops 675 h.p. could be relied upon to exceed this output very considerably. It is interesting to note that the dry weight of the Condor III with carburettors, magnetos, starting distributor and starting pipes, but excluding the reduction gear is precisely the same as that of the T.3. It will be fairly obvious that there will be very little difficulty in producing a modified direct drive Condor which need fear no comparison with American engines for racing aircraft whenever the occasion arises.

The Condor Series III engine has 12 cylinders mounted in two rows at an included angle of 60°. The cylinders are separately mounted on the crankcase, and are machined from steel forgings The cylinder heads, valve seats and the bosses for sparking plugs and starter connections are all machined from the solid, thus avoiding a good deal of that promiscuous welding frequently to be found in cylinders of this general type. Valve ports are welded to the cylinder head, and are machined for the valve guide bushes *in situ*. Incidentally it may be remarked that the interior of the valve ports, which form roughly 90° bends, are machined all over. To attempt to bore a circular hole which turns a right-angle corner sounds rather like attempting the impossible, but as a matter of fact it is accomplished very simply.

The cylinder jackets are formed of die pressed steel sheet, acetylene welded to the cylinder. Before the jackets are fitted the cylinders proper are zinc-coated to protect them from corrosion

The overhead camshafts are carried in steel tubular cases to which are brazed steel brackets bearing on the cylinder heads. The camshafts run in six split aluminium bearings and in two single-piece bearings one at each end of the casing. The shafts and cams are machined from the solid, hardened, and ground on cam faces and bearing surfaces. The correcting forming of the cams is assured by a copying grinder which is controlled by accurately shaped master cams made to a greatly enlarged scale.

For each cylinder there are three cams. The central cam controls two rocker arms, the two outer cams one valve each. As the cylinder heads are spherical and the valve seats directly in the head, the valve stems are divergent. The valve rockers must swing in a plane parallel to one which contains the valve axis, and this plane cannot be at right angles to the camshaft axis. Any attempt to operate the valve rockers directly, or through rollers rigidly attached to the rockers, would therefore lead to lateral loads on the rocker arms. This difficulty is overcome by interposing between the cams and the rockers cylindrical tappets running in vertical guides in the camshaft casing boxes. These tappets are slotted at the appropriate angle for the rocker arm and the end of the rocker arm projects into the slot and is driven from the hardened face at the bottom of the slot.

The drive for the camshaft and for all auxiliaries is taken from a spur wheel at the rear end of the crankshaft. This pinion is fitted with the Rolls-Royce friction damped spring drive which relieves the whole of the gearing from the effects of torsional vibrations of the crankshaft. This pinion drives a short shaft parallel to and above the crankshaft and this drives through a skew gear a cross shaft which drives the magnetos, and through bevel gears two inclined shafts which in turn drive the camshafts also through bevels. A third vertical shaft between the camshaft drives serves to operate the gas distributor for starting purposes. All shafts run in ball bearings and are provided with hardened serrated couplings which allow of slight variations of alignment and length caused by expansion of the parts. The whole of this gear with its casing forms a detachable unit which is shown in a photograph.

Oil, water and petrol pumps together with their gears are arranged to form another detachable unit which is attached below the crankcase. These auxiliaries are driven from the same spur wheel on the crankshaft. The water pump which is at the forward end of this unit has its shaft inclined. Two vertical shafts drive three oil pumps—one a pressure pump and two scavengers—two of these three, the pressure and one scavenger, being arranged one above the other on the same shaft. Two large scavenger oil filters are carried in the casing, large castellated plug heads which project on each side affording easy access to the gauzes.

A Briggs type petrol pump which by itself forms a detachable unit, is spigot mounted on one side of the casing when this item is required. The pump will deliver 120 gallons of petrol per hour or two and a-half times the full-power consumption of the engine against 20 ft. head and will lift from 18 ft.

The pistons are of aluminium alloy, fitted with two narrow compression rings and one scraper ring above the gudgeon

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pin and also one scraper ring at the base of the skirt. The pistons are of the Zephyr type always used on Rolls-Royce engines.

The connecting rods are of channel section, machined all over and of the forked type. The split rod carries a white-metal-lined steel-block big-end which bears over the whole length of crank pin. This block is cylindrical between the fork of the rod and white metal covered, and the straight rod end runs on this surface. The little-end bushes are of the fully floating type and are lubricated under pressure by oil conveyed to them from the crankshaft through steel tubes carried in the channel of the connecting rods.

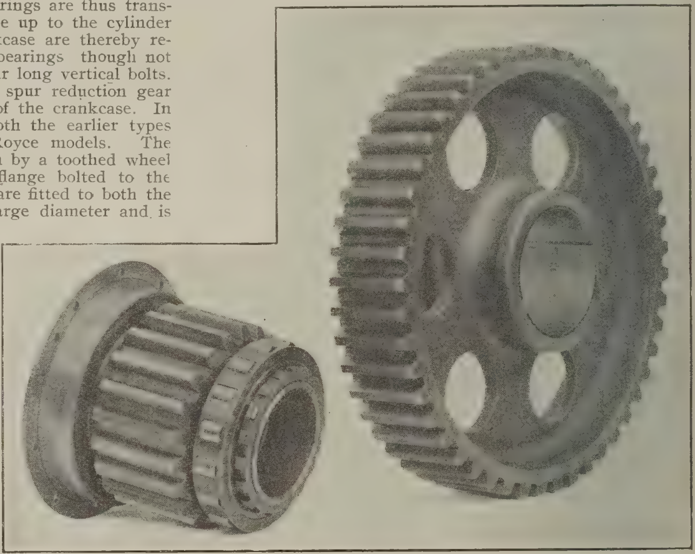
The six-throw crankshaft of nickel-chrome steel is of large diameter and bored throughout all journals and crank pins. The end of each section of boring is closed by a light plug held in place by long bolts passing through the shaft and making an oil-tight joint.

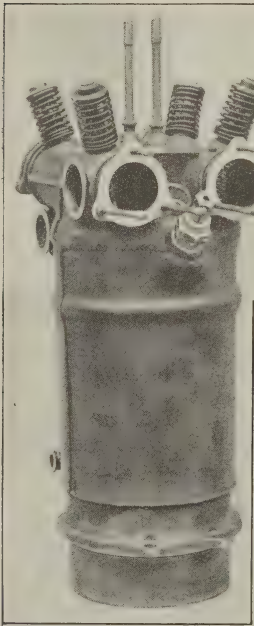
The crankcase is in two halves made of aluminium alloy split horizontally on the crankshaft centre line. It carries seven substantial crankshaft bearings of which the two end ones are carried directly in the crankcase. The five intermediate bearings are carried in the lower half by steel bridges each held into the crankcase by a pair of steel bolts running right across the case. These bridges carry each two long vertical bolts which in turn pass up through the top half of the crankcase and emerge between the two rows of cylinders. Loads on the crankshaft bearings are thus transmitted to the top crankcase casting close up to the cylinder attachments, and the walls of the crankcase are thereby relieved of such stresses. The two end bearings though not provided with steel bridges, have similar long vertical bolts.

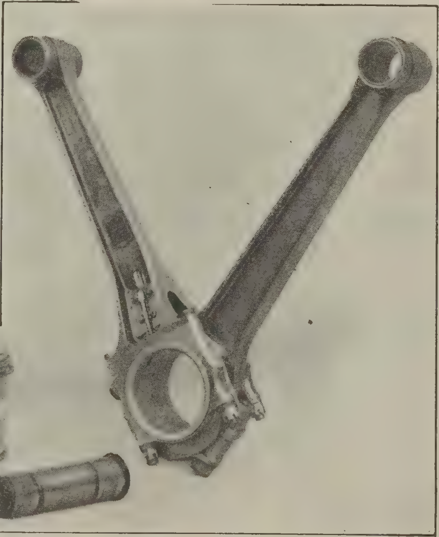
The Condor III is fitted with a single spur reduction gear carried in a housing bolted to the end of the crankcase. In this respect this engine differs from both the earlier types of Condor, and from all other Rolls-Royce models. The pinion is carried on a short shaft driven by a toothed wheel which floats in an internally toothed flange bolted to the crankshaft. Very large roller bearings are fitted to both the gear shafts. The airscrew shaft is of large diameter and is fitted with a flange to take the boss of a metal airscrew hub of the normal type. A separate unit containing gun control cam-gears is made to bolt into the reduction gear case if this is required.

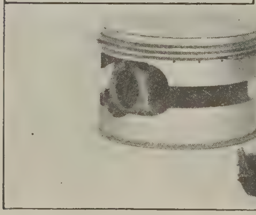
A special twin carburettor built by Rolls-Royce of the Claudel Hobson type supplies mixture to the cylinders. This is bolted to the after end of the crankcase low down giving the maximum possible head for gravity feed of petrol. A single central float chamber is used for both the carburettors, one of which feeds each row of six cylinders. A pair of mixture control valves, one for each side, gives a range of mixture control which is definitely fixed in the works and cannot thereafter be tampered with except by intentional alteration of the dimensions of the valve passages. The control valves are of a rotating type with conical seatings and govern the rate of flow from float chamber to jet.

The carburettor float chamber and throat are connected by air-pressure compensating passages which prevent harmful eddy-current effects and also allow the use of a sealed float chamber cover. There is only one petrol connection to the engine, and no chance of petrol leakage from the float chamber. In fact apart from the effect of breakages petrol cannot reach anything but the interior of the carburettor and cannot escape except by the correct route though the induction pipes or by the air intakes, which are arranged thoroughly









CONDOR COMPONENTS.—The photograph above shows the plain spur reduction gears used on the Condor engine. These gears are housed in a casing which locates and aligns the gears independently of the crankshaft, and the pinion is driven from the crankshaft by a floating coupling.

On the left is a complete cylinder, showing the four divergent valves. The sparking-plug-like object between the two valve ports is the starting gas connection.

Below and to the right of the cylinder a piston and gudgeon pin, and a connecting rod assembly.

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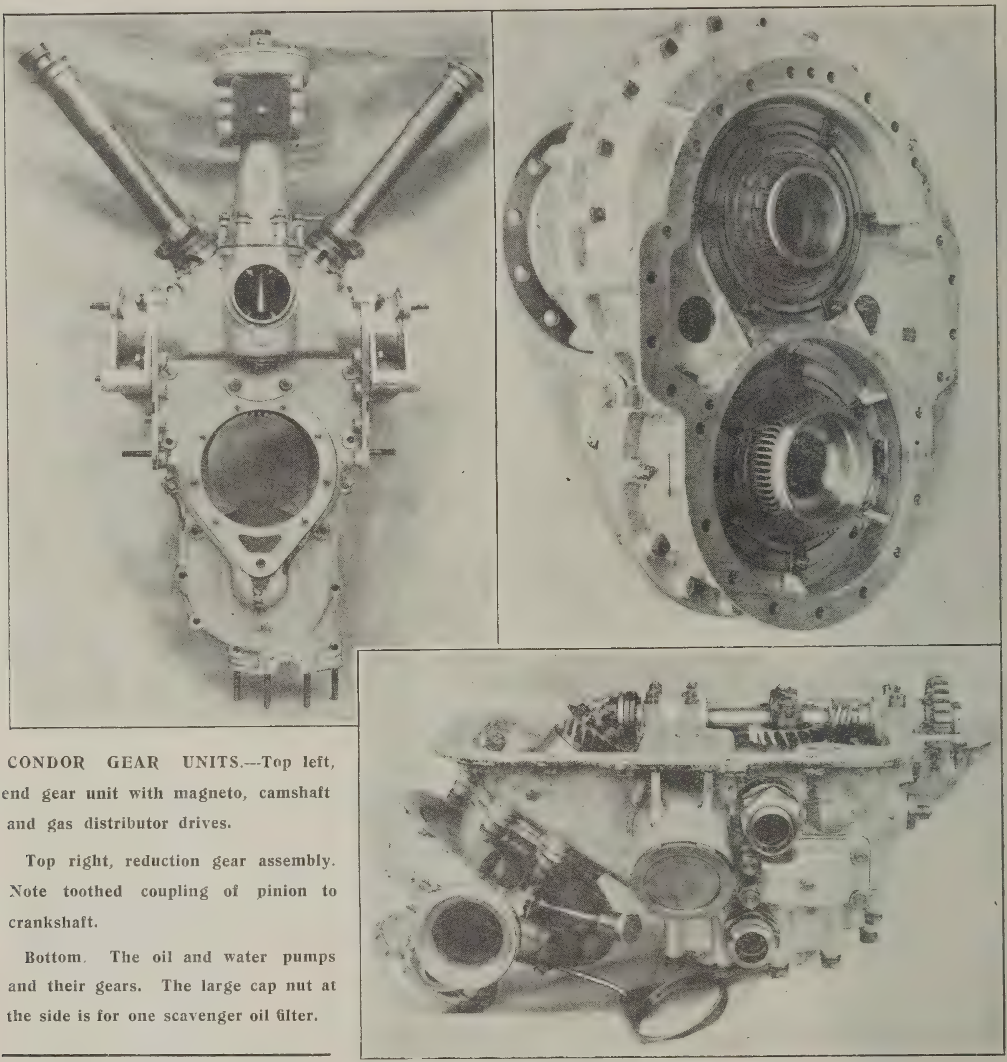


CONDOR GEAR UNITS.—Top left, end gear unit with magneto, camshaft and gas distributor drives.

Top right, reduction gear assembly. Note toothed coupling of pinion to crankshaft.

Bottom. The oil and water pumps and their gears. The large cap nut at the side is for one scavenger oil filter.

to drain the carburettor. The throttle and the mixture controls are so interlocked that the throttle cannot be closed without returning the mixture control valves to the "strong" position thus making it impossible for the pilot to attempt to open up the engine on a weak mixture.

Magneto and ignition control are coupled together in such a way that full advance of the magneto occurs at three-quarter throttle opening and the ignition is then slightly retarded if the throttle is further opened. Also in its most closed position the throttle does not cut out the pilot jet and the engine cannot be stopped by accidental overuse of the throttle control.

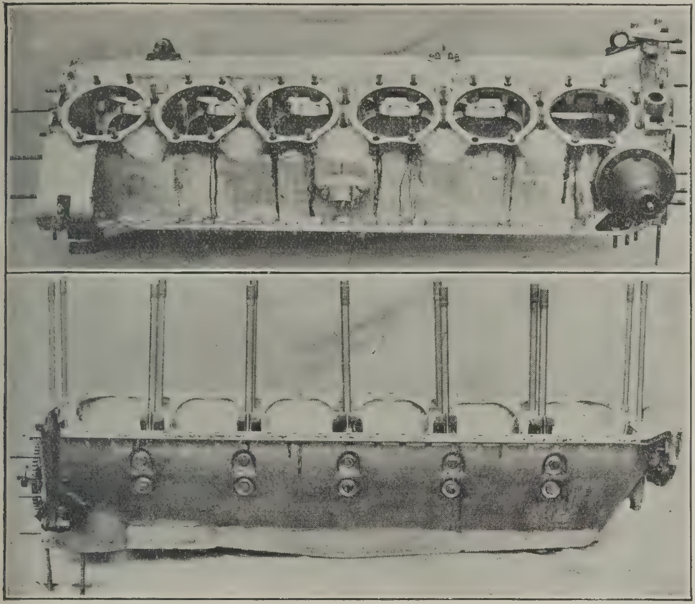
In the latest type of carburettor an extra air valve is fitted, which automatically admits extra air above the throttle. By the use of this control the petrol consumption of the engine at cruising speeds is improved, in fact it is possible to maintain a petrol consumption of not more than 0.5 lbs. per B.H.P. hour over the whole useful throttle range.

No rubber joints of the usual type are employed in the water system. Where flexible connections are necessary rubber rings in compression entirely enclosed in metal are employed. Water from the delivery side of the pumps enters the jacket at the heads of the third and fourth cylinder of each row and passes to the radiator from each end of the engine also from the cylinder heads. The bottom of each cylinder jacket is connected to the bottom of the adjacent jackets thus permitting convection flow between cylinders and providing means of drainage, but the main water circulation is directly along the cylinder heads where cooling is most necessary.

An interesting feature of the Condor III is the novel method provided for suspending the engine. The front (airscrew) end of the crankcase is fitted with two conical steel projections bolted on and provided at their extremities with cylindrical trunnions. These are carried in appropriate bearings attached to the main engine bearer tubes. The other end of the crankcase is slung from a pair of bell-crank levers pivoted on substantial brackets cast on the crankcase. One leg of each bell-crank projects vertically downwards and the ends of these legs are coupled together by a rod which passes through a tube in the lower half of the crankcase. The other leg of each bell-crank is horizontal and is carried by a pin on the other end of the main bearer tubes.

Rubber rings in compression between the lower end of the bell-cranks and the crankcase restrain and damp the movement of this link system. It will be seen that this system of mounting allows a certain degree of torsional deflection between the front and rear attachment of the engine to the machine without transmitting torsional stresses through the crankcase. The links are allowed a certain amount of end play on the pins which attach them to the main frame, thus giving the engine freedom to expand when heated up, a very necessary allowance in an engine of this size.

As will have been gathered from reference already made to the gas distributor and cylinder connections for starting gas, the engine is equipped for starting by a gas starter of the type originally devised by the late Major Norman of the R.A.E. A starter for the Condor engine of the four-stroke type which when complete will weigh not more than 50 lbs., has been designed and will shortly be ready for service.



THE CONDOR CRANKCASE.—In the bottom half the steel bearing bridges may just be seen and on the sides the heads of the bolts which hold these bridges into the crankcase. In the top half the faces for the long bearing bolt nuts can be seen between each cylinder base.

Note the suspension trunnion at the airscrew end of the lower half and the bracket for the suspension links at the other end. The link on the near side and the coupling rod which crosses the crankcase are on the end of the lower half-case.

It will be fairly clear from such descriptions as have been given that the manufacture of the Condor III engine is a fairly intricate process, and that as is the case with any first-class aero-engine a very high grade of workmanship is necessary throughout. Modern practice in the production of motor-cars—largely influenced by American ideas— has lead to a wide-spread belief that the commercial manufacture of really high-grade internal combustion engines is only practicable in factories with an extremely elaborate equipment of jigs and special machine tools and that owing to the enormous initial cost of such equipment production and sale in vast numbers alone will enable the manfacturer to sell his product at a reasonable price. There is of course a very considerable degree of truth in this belief but the Rolls-Royce works at Derby indicate fairly clearly that it has been very considerably exaggerated.

There is at present no prospect whatever that the demand for Condor Engines will ever reach figures approaching those which in the case of motor-cars might be considered to justify mass production methods. Therefore the adoption of the elaborate system of jigs and special tools appropriate to motor-car manufacture on even a moderate scale would involve enormous capital charges which spread over a small output would result in very high manufacturing costs.

The Condor is—for an aero engine—quite remarkably cheap and it is obvious that in a very large measure its low cost is due to the evolution by the makers of methods of production which secure all the necessary accuracy of workmanship throughout the engine without involving any colossal outlay on jigs and special plant. One single and somewhat hurried visit to Derby cannot entitle one to attempt to describe these methods in any sort of detail, nor would The Aeroplane suffice to contain such an account but it may be permissible to record the impression that the basis of Rolls-Royce production methods is essentially a recognition of the fact that for the very finest class of work individual intelligence and craftsmanship can still beat automatic machinery and semi-automatic labour. The absence from the aero-engine shop of very highly specialised machine tools and the very large preponderance of work which is carried out on lathes, drilling machines and the like with the aid of ingenious but usually quite simple fixtures is particularly striking. A visit to these works would in fact prove a useful corrective to certain tendencies which the Americanisation of the motor-car industry has developed in some of the younger school of engineering works managers.

The following tabular statement give the main data as to the dimensions, etc., of the Rolls-Royce Condor III.

Specification.

No. of cylinders	12
Bore	5½ in. (140 m/m.)
Stroke	7½ in. (190 m/m.)
Piston displacement	2,140 cub. in. (35 litres.)
Compression ratio	5.3/1
Normal output	650/670 h.p.
Normal crankshaft r.p.m.	1,900
Reduction gear ratio	.477/1
Normal airscrew r.p.m.	907
Maximum output	700/720 h.p. at 2,100 r.p.m. crankshaft (1,002 airscrew)
B.M E.P.	132 lbs./sq. in. (9.3 kg./cm$_2$.)
Piston speed	2,370 ft. per min.
Fuel consumption at normal output	40/45 galls. (88-100 litres) per hour.
Fuel consumption per B.H.P. hour	.5 to .56 pints (.22 to .25 kgs.)
Oil consumption	1 gall. (2.2 litres) per hour.
Weight, including carburettors, magnetos, starter distributor and pipes, but without reduction gear	1,154 lbs. (526 kg.)
Weight as above but including reduction gear	1,310 lbs. (596 kg.)
Length overall	69.325 ins. (1.76m.)
Height overall	42 in. (1.065 m.) (appr.)
Width overall	30.525 in. (0.778 m.)

The New Hispano-Suiza Engines.

Two new Hispano-Suiza aero-engines, one a 12-cylinder W engine of 450 h.p., and the other a 12 cylinder V engine of 500 h.p., to the designs of M. Birkigt, have just passed the 52½ hour test imposed by the Section Technique with success. These tests include a one hour test at nominal h.p. and r.p.m., five successive tests of 10 hours each at 9/10 nominal h.p., a further one hour test at nominal h.p. and r.p.m., followed by a 30 minute test at 5 per cent over nominal r.p.m.

The specification of the 450 h.p. engine which passed the above tests in December is as follows :—R.p.m., 1,800; h.p., 450, fuel consumption, 224 qr. (0.5 lbs.) per h.p. hour; oil consumption, 2.02 kgs. (.5 galls.) per hour; weight of engine, 376 kgs. (830 lbs.). The tests on the 500 h.p. engine have only just been completed and no figures concerning it have been so far issued.

An Italian Airscrew Reverse Gear.

A correspondent in Italy writes :—

On Feb. 2 and 5, Col. Luke Bongiovanni, who held the Italian altitude record of 2,600 m. (8,528 feet) in 1911, and ran flying meetings about the same time, submitted his airscrew clutch and reverse gear to Governmental inspection at the Isotta Fraschini motor works at Milan. The device which is epicyclic was fitted to a Gnome engine on a trolley.

It entails the airscrew being set out about four inches further from the engine and so possibly a longer crankshaft. The Technical Department has ordered air tests at once.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 13; Tuesday, 11; Wednesday, 16; Tuesday, 9; Friday, 13; Saturday, 16; Sunday, 10.

London—Paris—Zurich:
Handley Page Transport, Ltd., machines 11, passengers 58, freight 7,284 lbs.

London—Ostend—Cologne:
Instone Air Line, Ltd., machines 25, passengers 13, freight 20,775 lbs.

Manchester—London—Rotterdam—Amsterdam—Hanover—Berlin:
Daimler Airway, machines 28, passengers 27.

Paris—London:
Air Union, machines 14, passengers 37, freight 9,618 lbs.

London—Rotterdam:
K.L.M., machines 10, passengers 8.

Special Machines: 0.

Total number of trips by British machines: 64, carrying 78 pas. Foreign machines: 24, carrying 45 passengers.

Comparative Figures:
For week ending Mar. 9.
Machines, 88; Passengers, 123; Crews, 140; Total personnel, 263.
Corresponding week, 1923:
Machines, 61; Passengers, 197; Crews, 116; Total personnel, 313.
Corresponding week, 1922:
Machines, 44; Passengers, 110; Crews, 74; Total personnel, 184.
Corresponding week, 1921:
Machines, 31; Passengesr, 69; Crews, 35; Total personnel, 104.

Croydon Notes.

The weather on the air routes improved very much last week, with the result that there was a decided increase of passengers over the previous week's figures.

The early morning mist has interfered considerably with the running of the Manchester service, nevertheless 14 journeys between London and Manchester were made, though the passenger was small.

By error last week one stated that the D.H.34 which had been reconstructed to take larger wings was G-EBCX which was crashed at Rotterdam. This machine has been rebuilt with ordinary wings and it is G-EBBX which alighted in the sea off Ostend which has been reconstructed with the bigger wings. The landing speed of this machine has now been much reduced and her take-off is greatly improved but her performance in the air remains about the same as it was with the smaller wings.

The Surrey Flying Services are now preparing for the summer joy-riding season. Some Clergêt Avros are being converted to take four passengers instead of only two. It is understood that nearly a dozen such machines are being prepared for tours this season. It may be remembered that soon after the outbreak of peace the Avro Company used such machines for joy-riding.

On Tuesday of last week there was a serious fire at the aerodrome. During the absence in London of Mr. Rogers flames and smoke were seen issuing from the office of the British Petroleum Company and in a few seconds the whole place was ablaze. The aerodrome fire brigade arrived without delay and the fire was extinguished within eight minutes of its discovery. Mr. Shaw of Shell-Mex Ltd. and Mr. Hewlett of the Anglo-American Oil Co. Ltd. were both able to prove alibis and they consider that it is excellent testimony to the inflammable qualities of B.P.

Over at the Aircraft Disposal Company's shed Mr. Perry has been testing an Avro-Lucifer, an F.4 Martinsyde (with Lamblin radiators) and a D.H.9a. The company are now busy with an order for South America. The drawing office is going strong under Mr. Kenworthy and something may be heard of original designs shortly.

The Proposed Manchester-Plymouth Air Mail.

The Plymouth Chamber of Commerce is persisting in its efforts to arrange for an air service between that town and Birmingham and Manchester as a means of attracting the American mails to Plymouth. It is well known that the Aircraft Operating Co. Ltd., of which Mr. Alan S. Butler is Chairman and Major Hemming is Managing Director, is very interested in the proposal, and as the initiative of this concern is well known it seems exceedingly probable that something will come of the matter before long.

Educating Allies.

On Monday Mar. 3 at the Bickendorf Aerodrome, Cologne, the Instone Air Line took a number of German pressmen for a flight. The machine used was a D.H.34 (Napier) and Mr. F. L. Barnard was the pilot. The flight lasted for an hour and a half and the weather was somewhat gusty. Mr. Barnard kept the machine at a height of about 1,000 feet and went as far as Boppard. Before landing he came down low and flew with the wind behind him across the outskirts of Cologne at a speed of about 165 m.p.h.

Mr. D. Handover who was well known at Croydon in the early days and is now the Cologne manager for the Instone Air Line made a short speech in which he said that during the four years' operation of the Instone Air Line not a single passenger had been hurt. One hopes that he kept his hand pressed hard against a wooden table during this speech. He told them that hundreds of tons of all sorts of goods had been carried between London and Cologne. Among the articles carried were a consignment of live canaries, some swarms of bees, over two hundred motor cycles and billions of paper Marks. Up to 20 tons of goods were handled weekly.

Before leaving the aerodrome the German pressmen who were quite overcome by the novelty of their experience and also probably by the bumpy weather made a speech of thanks in which they stated that the Instone Air Line was "an invisible though strong link between Great Britain and Germany."

The Uses of Air Transport.

A lecture on "Air Transport And its Uses" was given before the Institute of Transport by Mr. G. Holt Thomas at the Institution of Electrical Engineers on Mar. 3. Sir Joseph Broadbank presided.

In the course of his lecture Mr. Holt Thomas said that although we were the first country to run an air service to a schedule time table little progress had been made in the last four years. The defence of the country would depend a great deal on the adoption of aircraft for commercial transport. Preparation against air attack was impossible. "The power to hit back" was the only defence. What would any country give in an emergency to be able to call on 250 commercial machines capable of carrying great weight at high speed.

The lecturer said he was glad that the suggestion he made three years ago had at last led to the foundation of a national company. Passengers who provided most of the receipts to-day could be left out of the question. A passenger would not care to fly 5,000 mile straight off but there was no reason why 20 separate pilots flying 20 separate stages should not make up a distance of 5,000 miles or even the 10,000 or 12,000 miles between London and Australia.

The cost of air transport must be higher than that of the slower forms of transport and if a decision could be arrived at as to the real value of delivering a letter in Sydney in ten days' flying by day or five days' flying night and day we should go a long way towards the universal adoption of air transport. Hr. Thomas estimated the cost of carrying letters by air to Australia at 1s. a letter and asked if that figure was in any way impracticable.

Mr. Handley Page said that he disagreed that the use of air transport was mainly for mails or goods. He said the great technical obstacle which held back air transport was the difficulty of flying when visibility was bad.

Sir George Beharrell said that he had been looking into figures lately and found that the reliability of the engines in civil aviation was now very nearly 100 per cent.—a factor which gave great confidence in the further development of the aeroplane. One of the difficulties of civil aviation was to get the facilities it offered before the right kind of business men. Its appeal was necessarily to a limited circle.

Captain A. Instone said that the remarkable immunity from accidents of civil aviation was obscured by failure on the part of the public to differentiate between Service and civil aviation accidents.

Colonel Edwards of the Directorate of Civil Aviation said that once the traffic was forthcoming running costs could be reduced. He also thought that eventually goods and passengers would be carried by different types of machines.

Uncivil Aviation.

There are aeroplanes which look right and are right, and there are aeroplanes which look all right but fly all wrong, and there are aeroplanes which look all wrong and behave accordingly. Also there are aeroplanes which merely look comic and fly after a fashion.

One of these arrived by air at a test station recently and set its tail down with considerable decision just beside the sheds. Officers and men walked out to inspect the new arrival. Out of respect for the pilot's feelings nobody was rude about it. Nobody even laughed. On the other hand nobody could honestly say anything complimentary about its looks, though it had a familiar appearance. And so there was a chilling silence while everybody wondered what the thing did resemble.

Then from the middle of a group of aerodrome mechanics came the resigned voice of an old flight-sergeant saying:—"Well! I suppose *somebody's* got to get this bleedin' earwig in!"

International Air Navigation.

The International Commission on Air Navigation began its sixth session on Mar. 4 in Paris. Practically all the nations who signed the Air Convention were represented. The English representative was Major-General Sir Sefton Brancker.

In the absence of M. Poincaré, who was otherwise engaged in trying to elevate the franc, the delegates were welcomed by M. le Trocquer, the Minister of Public Works. The main theme round which discussion centred was necessity of establishing international regulations for the security of air transport. This would seem to be in direct contravention of the well-known practice of doing in Rome what the Romans do.

The Way Things Happen.

It is reported from Christiania that on seven moonlight nights recently a large aeroplane has been observed flying along the Norwegian coast in the region of Fosnaes. Watchers have stated that judging by the noise of the engine it must be an aeroplane of immense power. It is fitted with powerful lights. The police are pursuing investigations and are of opinion that a large smuggler craft, a parent ship of the aeroplane, is anchored somewhere among the intricate maze of islands in the channel off Trondhjem.

It is considered that this is an indication that complete prohibition should undoubtedly be extended to Norway as otherwise this habit of seeing things is only likely to grow.

Aerial Rumrunners.

An aeroplane fitted with runners for landing on ice and adapted for the carriage of freight has been seized by the Canadian Customs authorities near Winnipeg. The police allege that the aircraft is one of several used by a syndicate of Minneapolis and St. Paul men for carrying whisky across the Canadian frontier to the United States.

The suspicions seem to have been unfounded or the rum-running to have been justified or popular however for the machine has been released to its owner who is President of the Aviation School of Minneapolis.

Wanted.

The Editor of THE AEROPLANE would be glad if any readers who have copies of THE AEROPLANE of Jan. 16, 1924 (Vol. XXVI No. 3), and do not want them, would send them to him at 175 Piccadilly.

PERSONAL NOTICES.

MARRIAGE.

PUMPHREY—PUMPHREY.—On Mar. 4, at Sunderland, Frederic Alan Pumphrey, Flg. Off., R.A.F., son of Mr. and Mrs. F. Pumphrey, of Vancouver, B.C., to Muriel, daughter of the late T. E. Pumphrey, J.P., and of Mrs. Pumphrey, of Mayfield, Sunderland.

BIRTH.

OLLEY.—On Mar. 2, at Dinant, Link Lane, Wallington, to Violet, the wife of G. P. Olley—a daughter.

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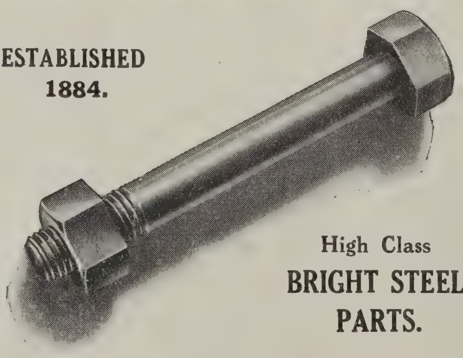

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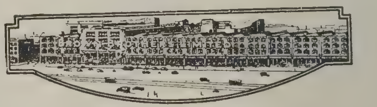

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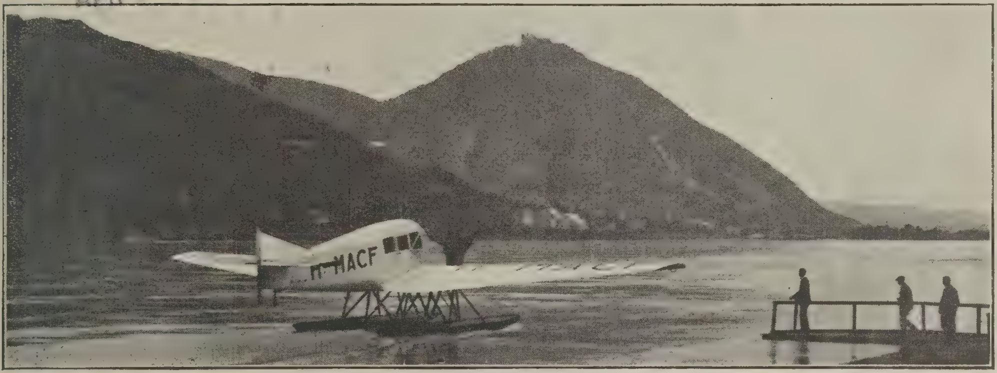

A Junkers Seaplane (185 h.p. B.M.W.) belonging to the Hungarian Aero-express R-T. at the landing stage at Nussdorf-Jedlesee on the Danube, near Vienna. In the background can be seen the Leopoldsberg.

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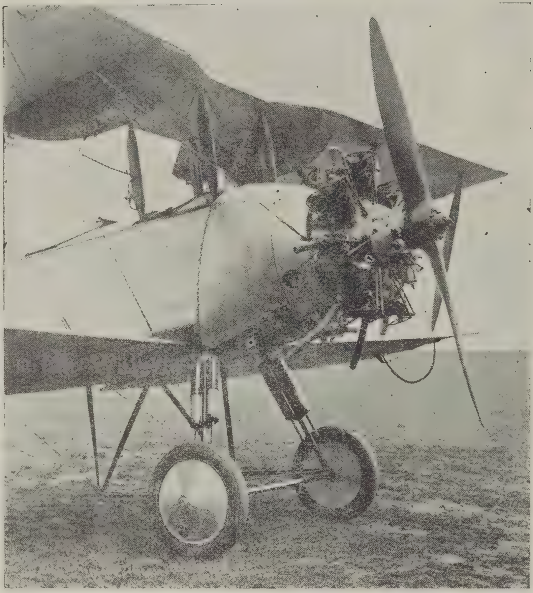

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ON THE RACE FOR THE KING'S CUP.

In an entertaining book by "Bartimæus" there is a story of the torpedoing of one of those unfortunate old cruisers which the Naval Staff, *more suo,* left to crawl about the North Sea early in the War 1914-18, apparently as groundbait for the German submarines. As the ship rolled over onto her beam ends those who were left of the crew slid down her side into the water, and on the way one seaman remarked to another, "'Ow far is it to Yarmouth?" "About three 'undred miles." replied his friend and asked "Why?" "I've got a aunt wot lives at Yarmouth." was the explanation, as they started to swim.

The story came to mind when one saw the announcement that the race for the King's Cup this year is to be for seaplanes and that the course and date would be announced later. For it occurred to one that having made such a momentous decision by sheer mental effort the Committee of the Royal Aero Club will probably fix the starting and finishing point of the race by some such process of reasoning as that which prompted the inquiry as to the distance to Yarmouth.

So far as one can gather the Committee decided to make the King's Cup Race into a seaplane race this year because last year so few people took the trouble to go and see the competing machines arrive at and depart from the stopping stations, or controls, at Birmingham, Newcastle, Glasgow, Manchester and Bristol, the result being that the amount of money taken at the gates was small and the Royal Aero Club lost money on the cost of running the race. It was argued therefrom that the people of Great Britain will not take the trouble to go out to their local aerodromes to see a procession of antiquated aeroplanes.—Which seems a reasonable assumption.

Personally one believes that the poor assistance at the controls was due to inadequate local advertising and to unskilful working of the local newspapers rather than to lack of public interest. The British Public was more interested in aircraft last year than it was the year before. This year it is still more interested.

But be that as it may, we are to have a seaplane race, and it is everybody's duty to help in making it a success. The question is, how is it to be done?

First of all there is the matter of entrants, for without entries a race is not highly attractive. There are no private owners of seaplanes, and it is unlikely that private entrants will be able to hire seaplanes from the Aircraft Disposal Co. as they have hired land machines in the past. Therefore the race must depend on the Trade.

So far as one can recollect the only firms which have built successful seaplanes during the past year are the Fairey Aviation Co., George Parnall, the Supermarine Works, and Vickers Ltd. The first has built only Service machines intended by Air Ministry specification to be laden like Christmas trees with assorted gadgets. One or two of these might be borrowed, possibly a IIID, and the amphibian Flycatcher. The Supermarine firm has built one racing flying-boat and several useful passenger-carriers, besides some Service amphibians, and a selection of these might be entered. Vickers Ltd. might put in two or three amphibian Vikings. And Parnall's might enter a Plover on a float.

What other entries are possible? The Blacbkurn firm might revive and revise the ill-fated "Pellet" which became a submarine at Cowes last year. Short Brothers have a very pleasing type of touring seaplane built two or three years ago and might enter it. Also they have nearly completed an all-metal light flying-boat with twin Blackburne engines for Mr. Lebbœus Hordern, an Australian. But apart from these it would seem that all other entries must be ordinary land machines stuck onto floats and in that case there is not likely to be much more novelty about the competing machines than there was in the over-land race of 1923 or 1922. We shall probably have an assortment of de Havillands as usual, only with floats instead of wheels.

Even if one or two firms go to the trouble and expense of building special machines for the race they are hardly likely to be very novel in idea, for there is no time between now and July or August in which to design and test novelties in racing seaplanes, not even to the extent of a retractable float undercarriage like that invented by J. V. Martin, the American constructor. There is not enough to be got out of the race to make it worth any firm's while to rush a special design through in the time. And, after all, the fastest seaplane in the World, the Curtiss which won the Schneider Trophy, is no novelty but only a land machine on floats.

Therefore, from the point of view of improving the breed of British aircraft one cannot see that any good will be done by making the King's Cup Race a seaplane competition this year. But if the Committee had given the Trade a year's notice of the change and had devised rules which would put land machines on floats out of the competition some good might have been done, for new designs would have been produced.

Secondly there is the matter of popularising British Aviation by means of this race. The assumption is, apparently, that in the Summer when the race is to be flown the bulk of the population of the British Isles sits on the edge dabbling in the sea, and that a string of seaplanes flitting by at a rate of knots will enthuse the dabblers. Will it? *Ca depend.*

It occurs to one that people of the class whom it is most desirable to impress with the value of seaplanes do not spend the Summer at popular middle-class seaside resorts such as those which are most likely to be favoured by the arrangers of the race. The wealthier people, peace-profiteers and so forth, go yacht-cruising to Norway or stay at less crowded seaside resorts in Cornwall and Devon or tour by motor in Scotland or France. The mass of the workers who have votes—at any rate those whom it is most desirable to impress, because of their present political tendencies—live in the North and in Scotland. For their Summer holidays they affect such places as Skegness, Scarborough, Rothesay, Douglas (Isle of Man, Blackpool and Southport.

Therefore if the Committee want to do good propagandist work it ought to start the competitors from the Humber or some such salubrious spot, turn them at Skegness and send them up the East Coast with controls at Scarborough, the Tyne, Leith, Dundee (for the benefit of Mr. Scrymgeour's constituents), Aberdeen and Inverness. Then they should fly down the Caledonian Canal, as did the competitors in the 1913 Seaplane Circuit, and call at Rothesay, Douglas, Blackpool and New Brighton. After which they could follow the Manchester Ship Canal and hop over the little bit of land intervening between that and the Humber.

Perhaps it might be better to start and finish at New Brighton, because of drawing the Liverpool and Birkenhead crowd, including His Lordship of the latter place. But, on the principle of having "a aunt wot lives at Yarmouth," the seaplane sheds at Brough on the Humber might prove more tempting than the gate-money at New Brighton, much as the associations of remote and inaccessible Cowes and Lympne always seem to have so much attraction for the Aero Club's officials as against handier and more profitable localities.

Just how the Committee proposes to retrieve by means of a coastal seaplane race the money which it lost on a race from aerodrome to aerodrome one cannot imagine. One can only hope for the club's sake that some financial genius has a working scheme for making gate-money without gates, enclosures or whatnots. One was always a trifle confused as a child between the Israelites' complaints of having to make bricks without straw and their subsequent longing for the flesh-pots of Egypt. It now seems possible that the people who longed for the flesh-pots were merely the members of the Committee, so-to-speak.

Still, one hopes that the seaplane race will be a great success. The foregoing remarks are not in the least intended as adverse criticism. They are merely designed to provide food for thought and to suggest some of the problems which the Committee has to face. Personally one would have thought that for this year at any rate, with so many people in London for the British Empire Exhibition at Wembley, a big race starting from and ending at a North London Aerodrome would have been most attractive to the populace and financially recuperative to the Club. But one can only say, as the young Counsel said to the Judge who contradicted him, "Doubtless your Lordship is right and I am wrong, as your Lordship generally is."—C. G. G.

THE WEST FRONT IN THE NEXT WAR.—III.

By C. G. GREY

THE PRINCIPLES OF HOME DEFENCE.

Judging by the Air Debate in the House of Commons on Feb. 19. the average Member of Parliament, who may be taken as fairly typical of the average "Man-in-the-Street," envisages Home Defence as an aerial battle between hostile bombing aeroplanes and our own fighting machines. If he should know a little about aircraft, as a result of a visit to the R.A.F. Pageant or to the Croydon aerodrome at the time of the show before the Prime Ministers of the Overseas Dominions, he probably thinks of Home Defence as a very much multiplied version of that highly amusing and decorative scrap between a big twin-engined machine and two small single-engined single-seaters. If he should by chance happen to be very intelligent he perhaps includes in his mental picture a vision of guns, searchlights and balloon-aprons, though so far as one can gather in casual conversation most people seem to think that the guns and lights which we used in 1918 were only intended to scare the enemy and were in fact a kind of relic of that comic R.N.V.R. affair which used to rejoice in the nickname of "Harry Tate's Navy" and ran about furiously with odd guns on motor lorries.

Just a few exceptionally intelligent Members said openly that attack was the best form of defence. This doctrine naturally shocks the susceptibilities of our good pacifists, for according to their principle of turning the cheek to the smiter we must sit still and be bombed twice (once for each cheek) before we retaliate by attacking the third raid or by sending a counter-raid to knock the organisation out of the enemy's aerodromes, factories and government offices.

Therefore it seems necessary at this point to lay down a few general principles of Home Defence. Thus perhaps those who gather their ideas on the subject from reading Air Debates as reported in the daily news-sheets may be enlightened by those who read more widely and intelligently.

Air Defence may be of two kinds, (A) Active, (B) Passive.

Active Defence consists in attacking the enemy with long-range bombing machines in such a way that his raids never start, or are materially hindered in starting.

Passive Defence consists in waiting till the enemy's aircraft arrive and then doing as much as possible with short-range fighting machines and land guns to stop them from doing damage or from getting away after doing damage.

These two forms of defence might justly be called Militant and Pacifist Defence respectively.

ACTIVE DEFENCE POLICY.

Active Defence is in the end more effective and less expensive than is passive defence (*vide* Von Clausewitz) but initially it may be more expensive and less effective. That is to say if the enemy is to be prevented from starting it is necessary to have a large striking force to raid his home bases. If that striking force should not be large enough then some of the enemy's raids will succeed and the people who suffer as the result will set up a cry that if the money which had been spent on the striking force had been spent on short-range fighters and guns and searchlights the enemy would have been kept away.

It is in fact the whole problem of a street row. If you see a row is coming, then hit the other fellow first. But be sure you hit him hard enough to knock him out. If you do not you will be worse punished in the end than you would have been if you had adopted a purely defensive attitude and had let him wear himself out in hammering your defence.

By ineffective air raids in 1915-16-17 the Germans merely stirred up a strong spirit of animosity among the so-called civilian population of this country and so helped to maintain enthusiasm for war. Also they gave our military people time (and new ideas) for anti-aircraft defence. If they had held back until they had a huge force and had delivered one smashing blow on London and Paris late in 1917 the effect would have been very different. We might not have been driven to make peace, but Germany might have come very near dictating the terms for an Armistice.

Therefore, if we are going to rely on Active Defence, or a defensive striking force, that force must be big enough to do its job thoroughly. And those who are to command that force will have to make up their minds how they are going to use it. That is to say, are they going to bomb towns or are they going to bomb aerodromes?

AERODROMES OR POPULACE?

Here there arises a very pretty problem. If one bombs towns, especially capital cities, *enough* then the populace will rise and insist on peace. But while one is doing it the enemy's bombers will still be bombing one's own towns, raising trouble, and rasing buildings.

And if one does *not* bomb the enemy's cities enough then one will only irritate his population and make them more warlike The effect of ineffective bombing is as the effect of slapping a man's face instead of knocking him out.

On the other hand, air forces being as yet small in all nations, a bombing force which would only be big enough to irritate a large poulation might be quite big enough to flatten out the enemy's aerodromes and prevent his raiders from starting at all. So it might pay very well to avoid bombing enemy towns and go for his aerodromes only until one's own air force had grown to such a size as to make it possible to smash enemy factories and industrial towns as well as aerodromes. The drawback to such tactics (they *are* tactics and not strategy, seeing that the aerodromes and towns would be fields of battle) would be that while one was checking enemy raids by bombing his aerodromes one would be leaving his factories undisturbed to build enough aircraft to enable him to hit back when he was ready.

Therefore the Air Officer Commanding Home Air Defences will have the difficult task of deciding whether to concentrate his Active Defence on breaking the nerve of the enemy populace while depending on his Passive Defence at home to preserve the nerve of our own people or to concentrate on smashing the enemy's aerodromes and keeping the enemy's raiders from starting while depending on his own Government to build still more aircraft till he has a force strong enough to bomb the enemy's towns as well as his aerodromes. His decision will doubtless be governed by the complexion of the Government of the period.

If it be a militant government the wiser policy will be to bomb the enemy's aerodromes and wait for more machines before tackling his factories. If it be a pacifist government then it will be wiser to bomb the enemy's factories (so as to keep down his supply of new machines) and to let his raiders come through to our own towns, especially to our capital, so that thereby the population may be infuriated and the government may be forced to action in spite of its pacifist opinions.

On the whole, whichever active policy be adopted, it may be taken that active defence is not only wiser as a matter of tactics but is actually necessary, except for a minute country such as Monaco or San Moreno or Andorra which might build a ring of guns round itself. No country the size even of England or Holland could possibly protect itself by passive defence against a decently organised enemy air force.

PASSIVE DEFENCE POLICY.

Nevertheless a Passive Defence Force is necessary, for it is unreasonable to suppose that England, or that any other country for that matter, is ever going to have such complete command of the air as to be able to prevent enemy aircraft from reaching its capital. And if only one or two raids penetrate to the capital they will be enough to stir up a political agitation which will force the government of the period to set up passive defences.

Apart from mere political motives a passive defence force is very well worth while, as was demonstrated by the London Air Defence Area which was organised by Major-General Ashmore in 1917-18. When the L.A.D.A. was first formed German aircraft came over almost unhindered and though the material damage which they did with their bombs was hardly worth considering the moral effect of their presence was enormous.

Whenever the approach of enemy aircraft was signalled all work in factories stopped and everybody took cover until the signal "All Clear" was given to notify that the enemy was outside the area affected. In the day-time this meant the loss of hours of work on the production of munitions. But at night it generally caused the shutting down of all factories till next day, for when the hands went home at the first warning they stopped at home.

It made no difference whether the raid was made by one enemy machine or dozens of them. Their mere presence stopped the work. And for the purpose of ending the war it made no difference whether munitions needed in the field were made and then destroyed before they could be used or whether they were not made at all. That is to say, if the artillery happened to be waiting for ammunition for a big bombardment on a certain day it was all the same whether its supply was delayed a day in the process of manufacture because of an air raid at home or whether the supply for a day was blown up in an ammunition dump behind the lines.

It was said that the blowing up of a big dump near Boulogne by an aeroplane bomb delayed one of our great attacks in France for a fortnight and so obliged us to attack in wet weather instead of in fine, with consequent bad results. At that rate the holding up of deliveries of ammunition caused by mere threats of aircraft attacks in England must have delayed the general progress of the war by many months.

Mr. Kellaway, at that time Postmaster-General, had the courage to state definitely in public that those people were all wrong who professed to scoff at air raids and who protested against what they called wasting men and material

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on Home Defence when they ought to be in France. He demonstrated that every attempted raid, apart from the damage it did, cost us several hundreds of thousands of pounds' worth of munitions not produced.

The Effect of Organisation.

The London Air Defence Area cured all that. By sheer organisation and assiduous training of personnel—almost all of whom with the exception of aeroplane pilots were unfit for service overseas—General Ashmore built up a system of defence which caused such heavy loss to the raiding aircraft that by May 1918 air raids ceased. They ceased partly because of the difficulty of finding pilots and crews who would face the danger of trying to get through our defences, but—it must be said in justice to the German Air Force—more largely because the damage done by the survivors was not commensurate with the losses entailed.

Not only did the losses inflicted on the enemy affect the enemy, but they raised the moral of the munition workers, who felt that it was worth their while to be brave while they were being defended by men who took risks which they could understand—for being on the spot these risks appeared much more real than those taken by the people in France. And so the production of munitions increased steadily as the Passive Defence became more efficient and more evident.

The more the populace heard the guns the happier they felt. Conversely, when the guns were not very busy the people became nervy. The classic instance was that of the famous silent raid on that night in October 1917. On that occasion a fleet of high-flying Zeppelin airships came over and because of a thick layer of cloud failed to find London at all. Our listening-posts located them exactly. The General gave orders that no search-lights were to be used and no guns were to be fired. One ship drifted with the wind across London and dropped a few bombs in a line from North to South. By pure luck one bomb fell in Piccadilly Circus and did some damage. But not a gun was fired, and so the ships never discovered where they were.

If we had started firing at the sound of the ships we should have given away the position of London, but owing to the clouds our gunners could not have seen the ships and our aeroplanes could not have attacked them. So silence was our best defence. But there was much more popular outcry over that silent defence than there was on another famous occasion when the alarm was given and all work was stopped and our whole artillery barrage burst into song because one of our own aircraft had lost itself and had flown into a prohibited area without introducing itself.

Offensive Defence.

It is of interest to note here that the German raids started from aerodromes in Belgium and that certain R.N.A.S. (and subsequently R.A.F.) units in Northern France were supposed to bomb those aerodromes and prevent the raids from starting. Our people did their best, but they had to do Army co-operation bombing and anti-submarine work as well, so with the material available they were never able to do more than discommode the German raiders.

Those who know how much work was done by these units in bombing German aerodromes will be able to form some estimate of the forces in men and material which will be necessary in the next war to make Active Defence effective.

Also, the fact that the Active Defence units were stationed in Northern France in order to prevent raids on London may help to indicate that future Home Defence units will not operate from Home Stations. If an enemy is bombing from an aerodrome 250 miles away it was silly to try and stop him by bombing from the same distance, for all things being equal one can only carry the same bomb-load that he carries. The obvious policy is to attack his aerodromes at the shortest possible range and carry a correspondingly bigger load of bombs instead of petrol.

(*To be continued.*)

THE DEBATE ON THE AIR ESTIMATES.

There is probably nobody in the World quite so happy as a Member of Parliament when he has unlimited opportunity for speech. So one is strongly tempted to report the Debate on the Air Estimates in doggerel verse under the heading "Felix Kept on Talking," arranged to the tune of a popular song of to-day. Unfortunately The Aeroplane is a serious paper dealing with a serious subject so one is compelled to treat this latest air debate more in sorrow than in satire.

One can only say that having been condemned for one's sins to study in detail every debate on aeronautical matters since Service aviation was first discussed in Parliament in 1909 one has never come across a more thoroughly futile debate than that which wasted the time of the House on Tuesday, Mar. 11. So far as one can gather from Hansard nobody said anything that has not been said *ad nauseam* for years, and the whole business could have been done in five minutes instead of in about seventy columns of Hansard.

Mr. Leach, the Under-Secretary of State for Air, introduced the Estimates in a good sound sensible speech in which he reviewed the work of the Air Force. He told the House that officers of the R.A.F. in Iraq are people of kindliness and good will and are not engaged in shedding the blood of defenceless natives nor are they recklessly using the air weapon for the purpose of terrorisation. He referred to the work of co-operation with the Navy and Army and defended the policy of a Labour Government in maintaining the Air Force. He said that we were not increasing armaments, we were decreasing them by adjusting them between the three Services. And he explained all over again the plans for home defence, organisation, recruiting and training.

He made the interesting statement that a party of officers with Air Vice-Marshal Brooke-Popham, Commandant of the Staff College, at their head, will visit France during the next few weeks at the invitation of the French air authorities.

He said that the flying hours of the R.A.F. at home during the past year showed an increase of 50 per cent over those of 1922. In India they showed an increase of 100 per cent. And the hours of flying for each fatal accident were 54 per cent. higher than during the previous year.

As to airships he said that Lieut.-Commander Burney would have full opportunity of laying his views before the Cabinet Committee which is considering the whole question.

He paid a tribute to the excellent work done by the Meteorological Service to which he said four thousand public-spirited observers all over the country supplied the Service voluntarily with rainfall records. 250 out of 306 climatological stations were maintained by private citizens and 500 officers on board merchant ships supplied observations from all parts of the World. The meteorological staff consisted only of 270 competent people doing valuable scientific work.

Sir Samuel Hoare, our previous Air Minister, expressed his sympathy with Mr. Leach, as he himself had been similarly attacked. The Estimates were he said his own with one exception. He thought it was worth noting that the Air Force had been doubled and the home defence force increased tenfold for a sum which in three years' time would only add 30 per cent. to the total Estimates.

Sir Samuel also devoted considerable attention to the airship scheme, but so far as this report is concerned reference to the subject may be held over till the Cabinet has decided to do something about it—or not.

Maj.-Gen. J. E. B. Seely delivered a considerable address in his usual style on the subject of bombing in which he quoted the following words by Marshal Foch :—

> "The potentialities of aircraft attack on a large scale are almost incalculable, but it is clear that such an attack, owing to its crushing moral effect on a nation, may impress public opinion to a point of disarming the Government; and thus become decisive.'

[Some day soon one hopes to find room in The Aeroplane in which to deal with all these exaggerated statements about the effect of bombing and the equally absurd idea with which so many Members of Parliament seem to be infected that the horrors of air war are greater than the horrors of land war. Briefly one may say that the bombing of a city accompanied by a certain amount of reasonably sudden death is probably infinitely more comfortable for those involved in it than would be the sacking of the same city by a conquering army which was deliberately let loose on a civilian population as would be the case in any advance into Western Europe by Tartar hordes. It is a recognised fact that no atrocities in the War 1914-18 approached in horror those committed by the Russian Army whenever it penetrated into enemy territory as it did in East Prussia and in Galicia.]

General Seely did however make the sensible suggestion that the Dominions ought to take a hand in air defence. But as usual he spoilt it by his method of presentation. He used the following curious phrase :—

> "The next point that I would ask the Prime Minister to take up, in connection with the Air, is to try and secure that the same interest which the Dominions have taken for years past in the Navy in time of peace, and in the Navy and the Army in time of war, they should take also in the air."

[From this one would judge that the Dominions did not take an interest in the Air Force in time of war. As a matter of fact one believes that at the time of the Armistice at least 50 per cent. of the pilots on active service were Colonials and that of these the majority were Canadians, though it must be said that Australians, New Zealanders and South Africans were all of equally high quality.]

Mr. Penny moved an amendment which was in effect identical with the motions put down by Sir Samuel Hoare in the House of Commons and by Lord Londonderry in the House of Lords during the past few weeks. He referred to Mr. Leach offensively by saying "He may be a most estimable young fellow, but I really feel he is not the right man for the position he holds," and "that if we have a

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man who can turn round in a fortnight from South to North he is not the man and he must be thinking of the remuneration of the office more than of the interests of his country."

For the latter phrase Mr. Penny was constrained to apologise, substituting for it the almost equally offensive statement, "He has preferred to stick in office rather than to do what he should do for the Air Force."

[The rest of his speech was about on a par with the average of General Seely's. Mr. Penny had evidently been filled up with a number of grievances by disgruntled people in the Air Force and not having the intelligence to digest the material merely made his speech ridiculous. It would be quite easy to pull his speech to pieces, but it is not worth while as it is not likely to be read by anybody who does not study Hansard.]

Lieut.-Col. Windsor-Clive seconded the amendment and said quite sensibly a great many things that have all been said before.

Lieut.-Col. Williams, who evidently knew nothing of the policy underlying our occupation, said various foolish things about Iraq and Palestine.

Capt. Wedgwood Benn, who certainly ought to know better, also spoke on the Get-Out-of-Iraq text.

Maj.-Gen. Sir Frederick Sykes, formerly Chief of the Air Staff and later the Controller General of Civil Aviation, spoke at considerable length on most of his pet hobbies, such as a Defence Ministry. On the whole he suggested at considerable length what is already being done by the Air Council.

Lieut.-Commdr. Kenworthy, who is really quite sensible on aerial matters, continued to advocate a World Conference for the limitation of aerial armaments, in which one cannot believe that he has any real confidence. He made the quite good point that it is extraordinarily foolish to spend money on aerodromes for fighting purposes at places where they can be destroyed by a possible enemy and he suggested that the assembly stations and ammunition stations of the Air Force ought to be where they cannot be reached.

Sir Philip Sassoon made a brief and quite sensible little speech in which he suggested that abolishing the police force so as to discourage burglars would have no attraction for the commonsense citizen, and that on similar grounds he did not agree with disarmament.

Mr. Austen Chamberlain deprecated the idea of waiting on the possibilities of an international agreement and emphasised the fact that we had one machine to put into the air against ten machines that could be brought against us.

Lieut.-Commdr. Burney put in a good word for airships.

Viscount Curzon said that he had no confidence in Mr. Leach, an expression of opinion which will probably be very encouraging to Mr. Leach.

Mr. Leach in reply said that he had listened to every speech in this House during the course of this Debate and not one had found any fault with the scheme outlined on behalf of the Government indicating their actions and purposes for the forthcoming year.

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Aircraft and the War Office.

In the Debate on the Army Estimates 1924-25 in the House of Commons on Mar. 13, the **Secretary of State for War** (Mr. Stephen Walsh) said :—

. . . The problems of defence are not merely matters of the General Staff of the Army. In almost every case they affect the two other fighting services. This brings me to the work of the new Committee of the Chiefs of Staff, which was set up by the last Government and is proving a great success. It saves a considerable amount of duplication of work. Military questions which require submission to the Committee of Imperial Defence can now be submitted, after they have been surveyed from the point both of the Admiralty and of the Air Force, with a view to securing a unified defence policy.

The Committee has met a considerable number of times, and has discussed and made recommendations to the Committee of Imperial Defence on such subjects as co-operative training between the Army and the Air Force, the relation of the Army to problems of air defence and various defence problems that affect the services jointly in various parts of the world.

As I have mentioned the steps taken to secure co-operation between the three services, I think the House would like to know what progress has been made in securing co-operation between the Army and the Air Force for home defence. This, as the House is aware, is one of the chief and most difficult problems with which we have to deal. In March, 1922, the late Cabinet decided that the Air Ministry was responsible for the defence of the United Kingdom against air raids. In December 1922 the Committee of Imperial Defence approved the arrangements made between the War Office and Air Ministry that the War Office should remain responsible for raising, maintaining and controlling, both in peace and war the ground troops which are required to assist the Air Force in the air defence of the United Kingdom, and for the design and provision of equipment for the anti-aircraft defences on the ground.

These troops were to be commanded by a military officer responsible, as regards operations, to an Air officer, who is himself responsible to the Air Ministry. During the winter of 1922-23 a joint committee of the General Staff and Air Staff drew up a general scheme for the defence of certain portions of England. The allotment of ground forces in this scheme was reduced to the minimum limits compatible with reasonable security.

The War Office is responsible for supplying ground defence formations proportionate to the air formations employed and the ground troops required to meet the scheme are estimated at some 22,000, which represents an increase of about 19,000 to the formation now authorised. It is intended to raise these troops as part of the Territorial Army. The annual financial cost of this increase when the scheme is complete has been estimated at £600,000, but the initial cost is still not determined.

Referring to the Territorial Army, Mr. Walsh said :—

. . . Perhaps the most interesting development in the Territorial Force is its growing connection with the Air Force. It is necessary to increase establishment in order to provide for certain anti-aircraft brigades to assist in home defence. The strength of these brigades will ultimately come to 22,000 officers and men. They will be recruited and organised by the County Associations. Money has been taken for this purpose, but difficult questions of organisation remain still to be solved before a definite scheme can be promulgated. Schemes are now under consideration by the War Office.

The Auxiliary Air Force Bill.

The text of the Auxiliary Air Force and Air Force Reserve Bill, was issued on Mar. 15. The main purpose of the Bill is to adjust and enlarge the powers conferred by the Air Force (Constitution) Act, 1917, in relation to the Territorial Force Acts.

The principal changes proposed are as follows :

(1) That county associations may be established under Part I of the Act of 1907, which may administer both the Territorial Army and the Auxiliary Air Force within the county.

(2) That a condition may be imposed on officers and men of the Auxiliary Air Force that they shall undertake liability to be called up for service within the British Islands in case of actual or apprehended attack, in defence of the British Islands, whether or not the Army Reserve or Air Force Reserve have been called out on permanent service.

(3) That men may be enlisted into the Reserve either as Reservists or as Special Reservists, whether they have previously served in the Regular Air Force or not.

(4) That a condition may be imposed on Reservists similar to that referred to in paragraph 2 above in the case of men of the Auxiliary Air Force.

(5) That men may be enlisted into the Reserve as Special Reservists for service within the British Islands only, in addition to those enlisted with the liability to serve outside the British Islands.

Civilian Reserves for the Air Force.

At a meeting held at the Royal United Service Institution on Feb. 20 Air Commodore R. H. Clarke-Hall discussed the value of civil aviation as a Reserve for the Royal Air Force in time of war.

Introducing the speaker Air Vice-Marshal Sir W. G. H. Salmond expressed his belief in the value of the light aeroplane as an instrument which would familiarise the young of the nation with flying, lead to the formation of flying clubs, and to the creation throughout the country of landing grounds.

Both Air Vice-Marshal Salmond and Air Commodore Clarke-Hall were however a little chilling concerning the utility of Civil Aviation as it now exists as a reserve for the fighting service. In this respect they have undoubted reason. But in one respect the lecturer seems to have been a little unkind to the civilian air services. He pointed out that there were in this country only 131 holders of civil aviation licences, and estimated that to maintain a force of 1,000 aeroplanes on active service 250 new pilots per month would be required. The whole civil aviation reserve would suffice for about a fortnight's supply.

Also there were only eighty-seven licensed civil aircraft of forty-two different types using twenty-one different types of engine and this diversity rendered it impossible to incorporate these machines in service units.

In the first place war experience undoubtedly showed a very high casualty rate among newly trained pilots. It also showed that the average useful life of the few pre-war pilots who really knew something about flying was very much greater than that of those trained under war conditions. The probable value of the few existing civilian pilots may therefore be considerably greater than their small numbers would indicate.

And on the subject of diversity of types it would be interesting to know precisely where the Royal Air Force stands in this respect at the present moment. The figures given for the civilian services show that there are on an average slightly more than two machines of each type. Taking machines in the possession of the R.A.F. to-day and excluding types which are mere survivors of the late war can the R.A.F. claim to possess an average of much more than two serviceable machines of each type?

After all the same Air Ministry policy of diffuse experimentation has governed the development of both civilian and military aircraft. This policy has its advantages, but it is scarcely fair to blame civilian aviation which after all does not pretend to have emerged from the experimental stage for a characteristic which is very fully exhibited by the R.A.F. itself.
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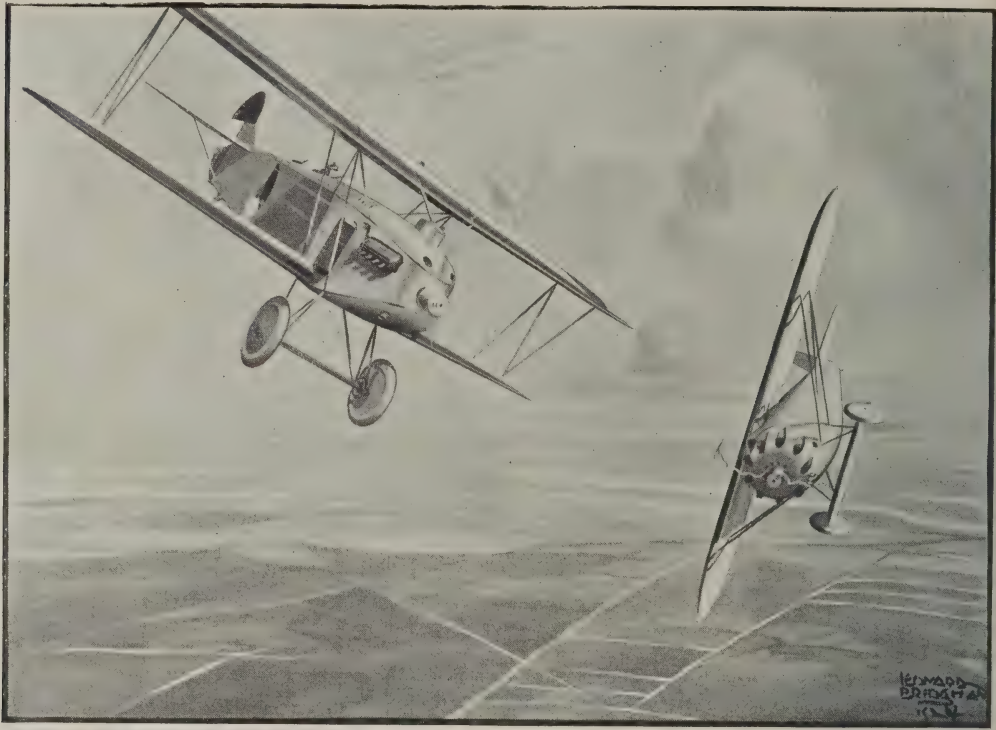

BRITISH ENGINES ABROAD.—In the recent competition organised by the Dutch Colonial Office for two-seater machines for use in the Dutch East Indies both competing machines, the Fokker CIV and the Koolhoven FK31, were fitted with British engines, the 450 h.p. Napier Lion and the 400 h.p. Bristol Jupiter respectively. The competition was won by the Fokker which had the best performance on figures. This machine is depicted by Mr. Leonard Bridgman on the left with the " Kully-bus " on the right.

The British Round the World Flight.

Wind and weather permitting, Squadron-Leader A. S. C. Maclaren, O.B.E., M.C., D.F.C. A.F.C., will leave Calshot for his Round the World Flight on Tuesday next, Mar. 25.

It is understood that the copyright of all writings done and photographs taken by the members of the expedition has been purchased by the *Times* newspaper, which, one may assume therefore, is financing the flight to such extent as may be necessary apart from the machine (and spares) provided by Vickers Ltd, the engine (and spares) provided by D. Napier and Son Ltd., and the petrol and oil provided by the Shell Company.

As Sq. Ldr. Maclaren will, with luck, have started before the next issue of The Aeroplane appears one takes this opportunity of wishing him and his companions all good fortune in their gallent effort to restore the prestige of British Aviation.

The U.S. Army's World Flight.

The U.S. Army expedition which is to attempt to fly round the World left the Clover Field, Santa Monica, California, on Monday, Mar. 17 at 09.32 English time. The flight is being made from East to West. The pilots are Major Frederick L. Martin in command and Lieutenants Lowell H. Smith and Leigh Wade all of the United States Army Air Service. The machines used are three Douglas " World Cruisers." It is expected that the flight will take about six months. The pilots intend to land at Croydon should they get as far as England and then fly to Brough where they will change their wheel undercarriages for floats which are being prepared for them by the Blackburn Aeroplane Co. Ltd.

The Imperial Air Transport Co.

Affairs appear to be moving in the direction of the actual coming into being of the Imperial Air Transport Company—commonly known as the Million Pound Monopoly Company. No definite information is available so far as the issue of the prospectus is concerned, but it is understood that the stock-in-trade of the four existing transport firms is being valued, presumably with a view to fixing the purchase price to be paid by the new company.

It is said that the valuation is being made by Brig.-General Bagnall-Wild, lately Director of Research at the Air Ministry, in conjunction with Lieut.-Col. Mervyn O'Gorman, formerly chief of the Royal Aircraft Factory. As both these gentlemen are among the pioneers of British Aviation and are trained engineers it may be taken that they will not make many errors in their estimates of values.

This is the more satisfactory in that less experienced valuers might find some difficulty in differentiating between engines which have been supplied direct by the manufacturers to the air lines and others which have been assembled from spare parts bought at scrap prices and in some cases, one is told, actually including parts taken out of scrap stores. The Government may be a big firm, but in the interests of the taxpayer who has to find the money for the subsidy it is as well that the air lines, which have already done very well out of their subsidies, should not be paid any more than it is worth for their flying stock, most of which is obsolete in any case.

Aerial Survey in Burma.

The Aerial Survey expedition under Mr. Ronald Kemp which is at present carrying out survey work for the Government of Burma is now in full swing. Mr. Kemp himself and Major Kennedy-Cochrane-Patrick are the pilots. The photographic work is being done by Capt. Durward assisted by Mr. Andrews. L.B. type cameras are being used but gave a little trouble at first owing to climatic conditions. The trouble has now been overcome. They have got quite up-to-date photographic plant, fitted with all modern appliances and the ground work is done by seven native photographers. The mechanical staff consists of Mr. " Jock " Anderson, Mr. Bishop and Mr. Parker, the remainder being Chinamen, Burmese, etc.

The D.H.9s are working pretty hard as are the staff, who find that seaplanes require a good deal more attention than do land machines. One machine has already done about 30 hours' flying and the other is by now also in commission.

The D.H.9 makes a very good seaplane and is very easy to handle on the water. The floats were designed by Mr. Kemp and built by Short Brothers. The performance of the D.H.9 has not altered very much by the addition of the floats, the machine only being about 8 to 10 miles per hour slower at maximum speed from a standard " 9." Mr. Kemp with Mr. Anderson as passenger and a full load in a test flight climbed

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The above illustration shows a Vickers "Vanguard" (23 Passenger) Aeroplane fitted with two Napier "Lion" Engines.

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to 10,000 feet in 30 minutes during the hottest part of the day.

Major Patrick is doing the actual survey work and is putting up a very good show, doing on average about five hours' flying per day. The expedition has two motor boats and a large steam launch and electric lighting plant has now been installed in the camp at Monkey Point, which is the head-quarters of the R.E. whose commanding officer, Captain Henry, has given most valuable assistance. Monsoon weather is expected shortly so things are being rushed on as quickly as possible.

A New Coupe Michelin.

It is announced that MM. A. and E. Michelin have instituted a further aviation contest to replace the old Coupe Michelin, to be known as the Nouvelle Coupe Michelin, for which they are presenting a sum of £100,000 francs (roughly £850 at present) to be divided into five annual prizes of 20,000 francs (roughly £180).

The contest is international and the winner of the bronze replica of the Cup and the 20,000 francs will be the pilot of the aeroplane which shall have achieved the greatest commercial speed over the closed circuit—Le Bourget—St. Inglevert — Valenciennes — Mourmelon — Metz (Frescaty) —Strasbourg (Neuhof)—Dijon (Longvic)—Bourges (Avord)—Clermont-Ferrand (Aulnat)—Lyon (Bron)—Nimes (Courbessac)—Toulouse (Latécoère aerodrome)—Pau (military aerodrome)—Bordeaux (Teynac)—Angers (Avrille)—Paris (Le Bourget).

Competitors may start at any one of the aerodromes and finish at the same aerodrome the landings being made in the order stated above.

The commercial speed is calculated by dividing the total length of the circuit by the total elapsed time from start to finish.

Full particulars and entry forms for this competiton may be obtained from the Aero Club de France, 35 Rue François Ier, Paris, and entries accompanied by an entry fee of 100 francs must reach the Commission d'Aviation not later than 18.00 hours two days before the day indicated for the start by the entrant.

The Nouvelle Coupe Michelin for 1923-24 has been awarded to Capt. Girier, who on a Breguet 14A2 (300 h.p. Renault) covered the 1923-4 course at a commercial speed of 136.211 kms. (85.132 miles) per hour.

It would appear as if the cost of each attempt to the firm entering the machine will be somewhat greater than the total amount of the prize money for the five years.

French Height Record Attempts.

On Mar. 7 M. Barbot made a further attempt to beat the Height Record. He left the Aerodrome at Francazal near Toulouse at 13.00 hours and landed again at 15.30 hours after having reached a height of 10,500 m. (34,440 ft.). He was flying a Dewoitine D1.C1. (300 h.p. Hispano-Suiza) and 1924 type Lamblin radiators. It is interesting to note that neither M. Barbot nor M. Sadi Lecointe used superchargers.

A New Seaplane Height Record.

On Mar. 11 M. Sadi Lecointe succeeded in reaching a height of 8,980 m. (29,454 ft.) on his Nieuport Delage seaplane, type 40 (300 h.p. Hispano-Suiza) thus beating the previous record of 6,368 m. (20,587 ft.) made by M. Hurel on a C.A.M.S. seaplane, by 2,612 m. (8,867 ft.). He left the Seine at Meulan at 11.08 hrs. and landed again at 12.59 hrs.

This record, which has been corrected by the Arts et Métiers and homologated as a World's Record, is the nineteenth World's Record made by M. Sadi Lecointe since the war, most of which have been on Nieuport-Delage aeroplanes fitted with Hispano-Suiza engines and Lamblin radiators, an excellent "record" for man, machine, engine and components.

A French Seaplane Accident.

A French seaplane which left Rochefort for Hourtins crashed on Mar. 14 and Quartermaster Grolleau was killed on the spot. The pilot, M. Cretin, was seriously injured. Lieut. Perrichon, commanding the air station at Rochefort was seriously injured and died later in hospital.

Test-flying in Holland.

Some interesting testing has recently been done at the Head-Quarters of the Royal Dutch Flying Corps at Soesterberg. A Fokker C.IV with Napier Lion engine and a Koolhoven F.K.31 with a Mark III Bristol Jupiter engine both two-seater fighters have been flown against one another with a view to deciding orders which are to be placed by the Dutch Colonial Office for East Indian defence work. (It will be noticed that the Dutch have no illusions about the peaceful intentions of Japan in the Far East.)

The specially tuned engine of the Fokker is giving approximately 500 h.p. and it is understood that the Mark III Jupiter gives approximately 380 h.p. It appears that the speed of the Fokker is higher but that the F.K.31 was more manœuvrable and apparently had a better climb. The speed of the F.K.31 is given as 144 m.p.h. and of the Fokker at 164 m.p.h. with full military load of 1,276 lbs. and 1,365 lbs. respectively. The F.K.31 climbs to 16,500 feet in 21 minutes and the Fokker to 15,000 feet in 20 minutes.

It is hoped that it will be possible ere long to try the F.K.31 with the new Mark IV Jupiter, which gives a full 450 h.p., with which power the speed of the machine will certainly be immensely increased. Rumour has it that the extraordinarily competent business organisation of Mr. Fokker has secured a larger proportion of the order for which these tests were held, though in the opinion of the experts of the Royal Dutch Flying Corps the F.K.31 has a number of features which make it as least as desirable for East Indian service as the C.IV.

The Belgian Coupe du Roi.

The 4th Concours International d'Avions de Tourisme for the Coupe du Roi, graciously presented for international competition by H.M. the King of the Belgians, will take place at Brussels during the month of June.

The competition is open to aeroplanes, single and multi-seaters, with engines of a cylinder capacity of not more than seven litres (7,000 c.c.).

Aircraft must cover a 300 km. circuit with two landings, and in addition points will be awarded as follows :—30 points for demountability, stowage and road transport; 30 points for general economy of the engine and construction of the aircraft with special consideration for metal construction, simplicity of construction from the owner-pilot's point of view, ease of self-starting by pilot alone, economy in fuel consumption and spare parts and the use of ordinary motor spirit and oil; 25 points for quick landing and 15 points for rapidity of take-off.

The winner will hold for one year the Coupe du Roi. In addition a Coupe-Challenge du Tourisme Aérien in gold to the value of 8,000 francs, will be awarded to the competitor who is classed first two years running or three years non-consecutively. A first prize of 8,000 francs, second of 5,000 francs and third of 2,000 francs will also be awarded.

The 1923 winner of the Coupe du Roi was M. Zdenko Lhota (Czecho-Slovakia) Avia monoplane (70 h.p. Anzani).

Full particulars of the competition may be obtained from the Secretariat de la Commission Sportive de l'Aéro Club de Belgique, 73A, Avenue Louise, Brussels.

Italian-built German Aeroplanes for Spain.

The Dornier factory at Pisa has recently delivered the first of a batch of eight Wals which are being constructed for the Spanish Government. This seaplane which has two Rolls-Royce engines and is constructed of duralumin has been designed for a crew of seven, two of whom are pilots. A good climb to a height of 4,000 feet with a useful load of 1½ tons has been accomplished. Sufficient fuel and oil for a six-hour flight was carried and a cruising speed of between 75 and 80 miles was attained.

A Russian Comparative Test.

Quite recently a Fokker D.XI (300 h.p. Hispano-Suiza engine) single-seater fighter was subjected to a competitive test with a certain well-known single-seater scout fitted with the same type of engine. The test was demanded by the Soviet Government and two pilots of equal ability were detailed to fly the machines. The Fokker D.XI proved to be superior in both speed and climb and it also carried a bigger useful load and took off in a shorter distance. It may be mentioned that the other machine was one of a batch recently supplied to the Soviet Government by the Nieuport-Astra Co. and is of the type known as 29.C.1.

The Modernisation of the Argentine Army.

According to information received from the Department of Overseas Trade, the Argentine Congress has recently passed a Bill authorising the expenditure of $100,000,000 (£18,200,000 approx.) for the modernisaion of the equipment of the Argentine army. Included in this is a certain allotment for aircraft *matériel.* A permanent Technical Commission and a foreign purchases commission have been formed, and members of the last-named arrived in Paris recently. This commission has been authorised to make immediate purchases and to make preliminary inquiries for further supplies. The immediate purchases are to be made from funds authorised under the Budget in force and are required for the training of next year's conscripts. The main purchases will not be made until the purchasing commission has reported in detail on the characteristics of the most modern material in each country visited, and until the permanent commission has studied this information.

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THE ROYAL AIR FORCE.

London Gazette.

Air Ministry, Mar. 11.

General Duties Branch.—The following are granted permanent commns. in the ranks stated (Mar. 12):—Flt. Lts. E. P. Mackay, N. V. Wrigley. Flg. Off. L. Martin.

A. C. Tremellen is granted a short service commn. as a Flg. Off. with effect from, and with seny. of, Feb. 26. The following Plt. Offs. are promoted to the rank of Flg. Off.:—J. G. Pinnell (Dec. 10, 1923); A King-Lewis (Feb. 16).

Flg. Off. H. W. Hewson resigns his S.S. commn. (Mar. 15); Flg. Off. J. W. Sole resigns his S.S. commn. (Mar. 12); Wing Cdr. P. S. Rickcord (Comdr., R.N., retd.) is re-attached for a further year's duty with the R.A.F. (Mar. 1).

Stores Branch.—Sqdn. Ldr J. E. Parkin, M.B.E., is placed on the retired list, and is granted the rank of Wing Cmdr. (Mar 12)

Reserve of Air Force Officers.—The follg. officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs. H. Hickson (Feb. 21); B. Martin (Feb. 23); K. W. Brewster, M.C., W. J. Hutchinson (Feb. 28); G. T. Legge, F. G. M. Sparks (Mar. 11). Plt. Off. T. L. I. Bell (Feb. 10).

War Office, Mar. 11.

REGULAR FORCES.—Commands and Staff.—The follg. appts. are made (Mar. 1):—G.O.C., T.A. Air Defence Brigs. and Inspr. of Regular Anti-Aircraft Units.—Maj.-Gen. E. B. Ashmore, C.B., C.M.G., M.V.O., from Cmdr., 1st Air Defence Brig. (Cl. T.).

Comdr. 1st Air Defence Brig. (Cl. T.).—Col. C. W. Collingwood, C.M.G., D.S.O., from Asst. Dir. of Arty., War Office.

Appointments.

Mar. 14.

General Duties Branch.—The follg. Plt. Offs. on probation are confirmed in rank:—A. H. Grace (Dec. 10, 1923); Y. W. Burnett, J. S. Dick, S. R. Sunnucks (Jan 9); G. J. Gaynor (Jan. 12); R. Barrett, P. R. Stroud (Jan. 16).

Week ending Mar. 17.

General Duties Branch.—Group Captain W. F. MacNeece, C.B.E., D.S.O., D.F.C., to Air Ministry for Air Staff (Operations) duties, 10/3.

Wing Commanders W. G. S. Mitchell, D.S.O., M.C., A.F.C., to R.A.F. Depot on transfer to Home Estab., 15/2, to No. 1 F.T.S., Netheravon (to command from 1/4), 28/3; A. J. Miley, O.B.E., to H.M.S. Argus pending taking over command of R.A.F. Unit, 8/3; J. N. Fletcher, A.F.C., to R.A.F. Depot pending disposal, 1/4; J. T. Cull, D.S.O., to H.M.S. Hermes to command R.A.F. Unit, 19/2; D. L. Allen, A.F.C., to Air Ministry for Technical Staff duties, 10/3.

Squadron Leaders A. G. Horsley-Carr, O.B.E., to Experimental Station, Porton, 4/4; J. K. Wells, A.F.C., to Arm. and Gunnery School, Eastchurch, 17/3; P. C. Maltby, D.S.O., A.F.C., to R.A.F. Depot on transfer to Home Estab., 13/2; A. C. Maund, C.B.E., D.S.O., and O. G. W. G. Lywood, O.B.E., to R.A.F. Depot on transfer to Home Estab., 15/2.

Flight Lieutenants D. H. Dabbs, to R.A.F. Depot on transfer to Home Estab., 22/2; A. H. Pearce, D.F.C., to R.A.F. Depot on transfer to Home Estab., 26/1; P. C. Wood, to H.M.S. Hermes, 19/2; J. W. Woodhouse, D.S.O., M.C., to No. 111 Sqdn., Duxford, 1/4; E. J. Cooper, D.S.C., to Aeroplane Exper. Estab., Martlesham Heath, 19/3; R. Harrison, D.F.C., to Boys' Wing, Cranwell, 7/4; J. Lawson, to H.Q., Inland Area, Uxbridge, 24/3.

Flying Officers B. H. Godfrey, to School of T.T. (Men), Manston, 1/4; J. R. Bell, D.F.C., and E. H. Searle, to Boys' Wing, Cranwell, 1/4; W. Sanderson, A.F.C., to H.Q., Coastal Area, 1/4; L. Darvall, M.C., to No. 20 Squadron, India, 19/2; H. H. S. Scott, D.S.M., to No. 1 School of T.T. (Boys) Halton, 24/3; R. Menzies, to School of T.T. (Men), Manston, 2/4; J. Dunn, to No. 208 Sqdn., Egypt, 5/3; J. J. C. Cocks, to No. 11 Sqdn., Bircham Newton, 7/3; A. N. MacNeal, to R.A.F. Base, Leuchars, 17/3; R. Kennedy, to R.A.F. Base, Gosport, 17/3; W. J. Eldridge, D.S.O., M.C., to School of Army Co-operation, Old Sarum, on transfer to Home Estab., 22/2; H. W. Allen, A. G. Hill, and A. H. J. Howlett, to R.A.F. Base, Gosport, 8/3; S. H. Reynolds and W. H. Jinman, to H.M.S. Hermes, 19/2; W. F. R. Gough, R. H. Stewart Peter, and R. O. Rigg, to R.A.F. Base, Leuchars, 17/3; H. T. Herring to R.A.F. Base, Gosport, 17/3.

B. H. Godfrey, to R.A.F. Depot, on transfer to Home Establishment, 13/11; C. A. Elliott, to R.A.F. Depot on transfer to Home Establishment, 13/2; H. K. Goode, D.S.O., D.F.C., to R.A.F. Depot on transfer to Home Estab., 15/2; G. E. F. Boyes, to School of Army Co-operation, Old Sarum, 17/3; M. W. J. Boxall, to No. 7 Sqdn., Bircham Newton, 17/3; C. A. Raven, to School of Army Co-operation, Old Sarum, 17/3.

Pilot Officers J. M. Darroch, to No. 2 Sqdn., Andover, 17/3; R. H. Bibby, to No. 25 Sqdn., Hawkinge, 17/3.

Medical Branch.—Flight Lieutenants (Medical) H. B. Troup, to Stores Depot, Iraq, 13/2; E. C. K. H. Foreman, to R.A.F. Depot on transfer to Home Estab., 29/3. Flying Officer (Dental) H. J. Henderson, to R.A.F. Base, Leuchars, 31/3.

Store and Accountant Branch.—Squadron Leader (Stores) F. H. Songhurst, M.B.E., to No. 1 School of T.T. (Boys), Halton, 17/3. Flying Officers (Stores) W. C. Farley, to H.M.S. Hermes, 19/2; R. T. Rich, to R.A.F. Depot, on transfer to Home Estab., 13/2.

The King's Levee.

His Majesty the King held a Levée at St. James's Palace on Mar. 11. Among those in attendance upon His Majesty was Air Chief-Marshal Sir Hugh Trenchard, Principal Air Aide-de-Camp. Group Captain C. L. N. Newall, Air Aide-de-Camp in Waiting, was also present.

The following members of the Diplomatic Corps who are directly concerned with aviation were among those introduced by the Marshal of the Diplomatic Corps:—

Senor Colonel Don Fernando Rich (Spanish Embassy), Lieut. Aviateur Willy Coppens (Belgian Legation), Count Albrecht Bernstorff (German Embassy), Capitaine Sablé (French Embassy), Commander J. H. Towers (U.S. Embassy), Major H. C. Davidson (U.S. Embassy), Colonel Sylvestre Blaha (Czecho-Slovak Legation)

The following were among the presentations made in the Diplomatic Circle:—

Capitaine Silvo Scaroni (Air Attaché, Italy).

Among those who attended the Levée were the Secretary of State for Air, Air Vice-Marshal P. W. Game, Air-Commodore C. A. Longcroft, Sq. Ldrs. P. Babington and G. R. Reid.

The following Officers of the Royal Air Force were presented to the King on appointment:

Flt. Lt. A. Brooke, Sq. Ldr. W. Bryant, Flt. Lt. T. Clogstoun, Sq. Ldr. A. Cole, M.C., D.F.C., Flg. Off. G. Dean, Sq. Leader H. G. Dean, A.F.C., Sq. Ldr. F. Don, Sq. Ldr. J. Everidge, M.C., Flt. Lt. O. Gayford, D.F.C., Sq. Ldr. Hanmer, D.F.C., Flt. Lt. C. Pilkington, A.F.C., Flt. Lt. E. Simpson, Flt. Lt. F. Vincent, Plt. Off. G. Worthington.

A Twin Engine Reserve School.

It is understood that a school for training R.A.F. Reserve personnel on twin-engined machines is to be opened at Brough, which is the aerodrome of the Blackburn Aeroplane Company, Ltd., and pilots who had experience on twin-engined machines during the War are to be sent there for training. It will be remembered that a seaplane school for the Reserve is also to be opened there at once.

THE R.A.F. SPORTS BULLETIN.

(Published in Collaboration with the R.A.F. Sports Board.)

Boxing.

It is announced that the Imperial Services Boxing Association Championships will be held at Portsmouth from Apr. 30 to May 2 inclusive. No operations will take place in the afternoon. The honorary secretaries have recommended that the light heavyweight and bantam weight competitions for officers should be reintroduced at the 1924 meeting. The Rev. H. D. L. Viener, Chaplain-in-Chief of the R.A.F., will officiate.

The R.A.F. Team Championships.

The R.A.F. team competitions were concluded on Feb. 23 at Winchester with the following results:—

Officers (Finals).—*Light-weights*: Flt. Lt. Howard (Andover) beat Flg. Off Venmore (Lee-on-Solent).

Welter-weights: Flt. Lt. Garrity (Halton) beat Flg. Off. Walkington (Lee-on-Solent).

Light-Heavy-weights: Flg. Off. Cavis-Brown (Spittlegate) beat Flg. Off. Hancock (Lee-on-Solent).

Heavy-weights: Flg. Off. Wintour (Andover) beat Flg. Off. Vosta (Halton).

Other Ranks (Finals).—*Fly-weights*: AC. May (Kenley) beat AC. Ward (Andover).

Bantam-weights: AC. Bridge (Andover) beat L/AC. Williamson (Henlow).

Feather-weights: AC. Roberts (Kenley) beat AC. Giblin (Halton).

Light-weights: Sjt. Stone (Andover) beat AC. Fanner (Kenley).

Middle-weights: AC. Marshall (Kenley) beat Cpl. Finney (Andover).

Light-Heavy-weights: Cpl. Barrett (Halton) beat Sjt. Thompson (Cranwell)

Welter-weights: AC. Ballantyne (Andover) beat AC. Jenkinson (Cranwell).

Athletics.

Corporal O. C. Clarke won the cross-country championship of the R.A.F. for the third time in succession at Uxbridge on Mar. 5. Twenty units competed and the course of 5¾ miles was completed by 165 out of 183 runners.

The results were:—

INDIVIDUAL CHAMPIONSHIP:—1, Corporal O. C. Clarke (holder), Halton "A," (35.0); 2, AC. Turner, Uxbridge (35.5); 3, AC. Ferris, Uxbridge (35.59); 4, AC. Taylor, Manston (36.18); 5, L-AC. C. Lowther, Halton "A" (36.23); 6, AC. Morgan, Manston (36.48); 7, AC. Jerrett Calshot (36.48); 8, AA. Ballard, Halton "A" (36.58); 9, AC. Dunn, Calshot (37.3); 10, AA. Moule, Halton "A" (37.5); 11, AC. Wright, Calshot; 12, AC. Brown, Halton "A"; 13, AC. Hoare, Halton "A"; 14, AC. Sanderson, Uxbridge; 15, AA. Faby, Halton "B"; 16, AC. Deverell, Gosport; 17, AC. Mutch Cranwell; 18, AC. Fearless, Calshot; 19, AC Golightly, Halton "A"; 20, AC. Johnson Manston.

TEAM CHAMPIONSHIP (SENIOR):—1, Halton "A"; 1, 5, 8, 10, 12, 13, 19, 22, total 90 points. 2, Manston (holders): 4, 6, 20, 24, 38, 39, 52, 53, total 236 points. 3, Halton "B"; 15, 32, 33, 37, 43, 44, 45, 54, total 303 points. 4, Uxbridge, 351; 5, Cranwell, 442; 6, Gosport, 514; 7, Henlow, 593; 8, Flowerdown, 693.

(JUNIOR).—1, Calshot: 7, 9, 11, 18, 21, 27, total 93 points. 2, Farnborough: 42, 60, 72, 82, 86, 93, total 435 points. 3, Eastchurch: 31, 47, 48, 76, 100, 139, total 441 points 4, Andover, 516; Hawkinge, 607; 6, Ruislip, 634; 7, Duxford, 548; 8, Upaven, 667; 9, Shotwick, 679; 10, Kenley, 801; 11, Spittlegate, 804.

A 28 Squadron Re-Union.

The Old Boys' Association (Other Ranks) of 28 Squadron, R.A.F., are holding a Re-union on Mar. 29 at Shearn's Restaurant, 231, Tottenham Court Road, W.1 The Re-union which will take the form of a Whist Drive and Dance will start at 6 p.m.

Tickets 3s. single and 5s. 6d. double (including refreshments) may be obtained from C. T Hodges, 102, Camden Street, N.W.1.

The Middle East Dinner.

The Middle East dinner will be held at the Café Royal on June 3 the evening before Derby Day.

The guests will be Sir Samuel Hoare, formerly Secretary of State for Air, and Major-General Sir Louis Bols who was Chief-of-Staff to General Allenby in Palestine.

The dinner is being organised by Flt. Lt. Aune, the Air Ministry. Full particulars will be announced in The Aeroplane in the course of the next few weeks.

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THE LIGHT AEROPLANE COMPETITION, 1924.

The regulations drawn up by the Royal Aero Club—in consultation with the Air Ministry and the S.B.A.C.—for the competition to be held for the prizes offered by the Air Ministry this year were reported in a recent issue of this paper.

They have evidently been drawn up with very considerable care in order to ensure that only a machine having a good all-round performance shall win the chief prizes so that it seems fairly safe to prophesy on general principles that the eventual prize-winners will prove to be out and out freaks. If this is the case it will be all to the good—however disappointed the Air Ministry may be.

After all the chief value of a contest such as this is in the exercise which it affords to the ingenuity of the designer. Competition rules never can accurately simulate practical working conditions—the best they can do is to give the designer a problem in compromise of a somewhat less vague nature than is presented to him in the ordinary course of events.

That being the case it is not proposed to criticise the rules as they bear on the utility of the machines which are likely to be produced to meet them. Nevertheless there are one or two details of some interest to be found in them.

The Certifying of Airworthiness

It is understood that the somewhat puzzling statement that although a Certificate of Airworthiness will be necessary for competing machines, the Air Ministry does not require to be supplied with drawings, implies that the Air Ministry is prepared to despatch to the makers' works a stress merchant who will go through the designer's calculations and accept, or reject, them on the spot. This is undoubtedly an improvement on the current practice whereby the data regarding a given machine lie in a pile of papers until the individual to whose care they are relegated has worked down to them and then become the subject of correspondence through "the official channel" concerning any queries which may arise in the course of stressing. It may be suggested that this particular method of dealing with strength calculations might advantageously be extended to other machines than those now in question.

The method of awarding marks for speed range as a percentage of minimum speed is sound and ingenious. There is, however, one somewhat curious feature about the rules in this matter, and that is that whereas the low speed is to be taken by timing over a short straight course flown in both directions, the top speed is to be taken over a fairly long distance flown round a circuit.

The Influence of Weather on Marking.

The minimum speed will therefore be the true minimum speed—as any effect of wind will be neutralised—whereas the top speed—unless the course can be flown in a dead calm—will be less than the true top speed, or even than the true cruising air-speed by an amount which will depend on the nature of the course and the wind which is actually blowing at the time the test is made. Therefore unless all the competing machines can make their high-speed tests under identical conditions—that is to say practically all at the same time—the results may not be fairly comparable.

Quite obviously the committee drawing up the rules had in mind the desirability of using as the basis for marking, not a speed which could be maintained only for a short burst under good conditions but speed that could in practice be maintained for a considerable period. This is entirely reasonable, but the desired end could be obtained in other ways. The top speed as measured over a speed course is a definite measure of one quality of a particular aeroplane. This speed bears a fairly definite relation to that which can be maintained for a long distance provided that the engine is not unduly pressed in attaining it. It would obviously be possible so to doctor an engine that it would last for the half hour necessary for a top-speed test, but break down hopelessly after another hour's running at 60 per cent. of the power developed in the first half-hour.

An Alternative High Speed Test.

This method of attaining a high top speed could easily be ruled out by taking the average speed over the course for the whole of the ten hours' flying which is called for in the rules, and disqualifying any top speed which bore an abnormal ratio to the maintained average. Some discretion might have to be exercised in respect to the nature of the weather during the competition in assessing what constituted an abnormal ratio, but there does not seem to be any serious difficulty.

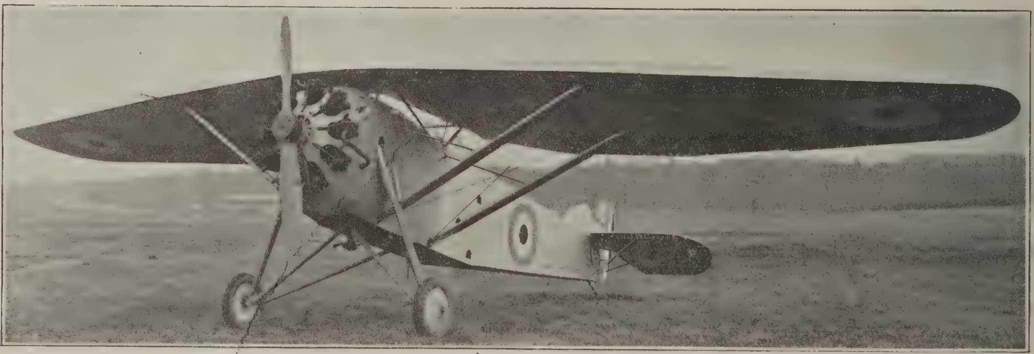
The top speed itself should not necessarily be taken as the marking basis—an equivalent cruising speed corresponding to the ground speed over a circular course in a 10, 15, or 20 m.p.h. wind for a steady air speed of, say, 85 per cent. of the maximum speed could be computed and used as the basis for marking.

It seems obvious that at least one of the reasons which led to the adoption of rules for the high-speed test was a desire to give the faster machines due credit for the lessened effect on their average ground speed of wind, but the particular method adopted depends too much on the actual wind which happens to blow during the test of each individual machine.

Slow Machines not Favoured.

There seems to be an idea prevalent in some quarters that the system of marking for the speed test will tend unduly to favour machines with a very low landing speed, rather than such as have a reasonable top speed. It may be pointed out that the effect of taking the top speed over a total distance of 150 miles and exacting a minimum average speed of 60 m.p.h. means that the designer must either gamble on having extremely good fortune with his engine and a chance of flying for 2½ hours in a dead calm, or he must design for a maximum airspeed of at least 75 m.p.h. And the lower his actual top speed, the more m.p.h. he will lose as a result of any wind during the high-speed tests. Unless, therefore, the top-speed tests can be made in very nearly a flat calm the conditions do not favour a uselessly slow machine.

Altogether the rules seem likely to produce a very interesting meeting, always providing that the Air Ministry's staff of stress merchants do not break down over their part of the work.



THE HAWKER DUIKER (400 h.p. Bristol Jupiter engine).—In combination with the photograph reproduced in the issue of Mar. 5, this illustration gives a very complete idea of the characteristics of this two-seater Corps Reconnaissance machine. Noticeable features are the marked sweep-back of the wings, and the novel form of undercarriage.

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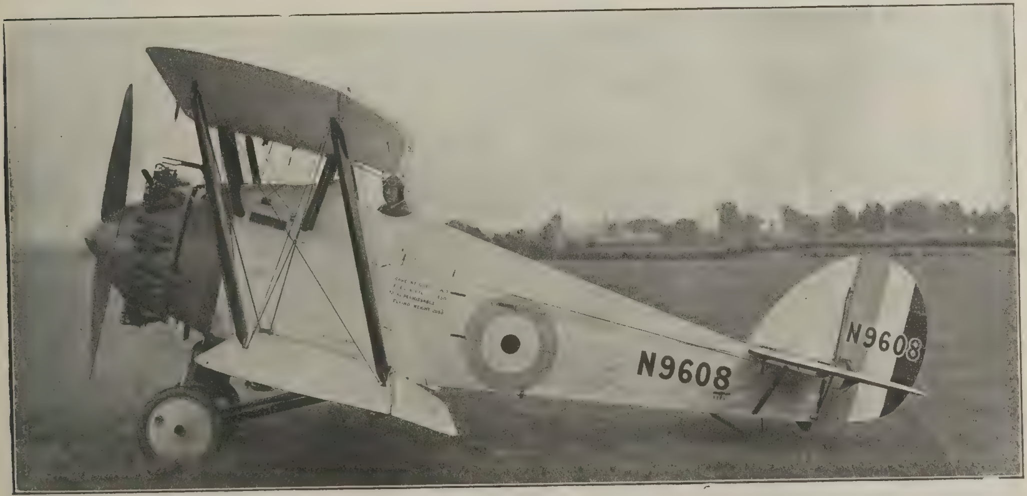

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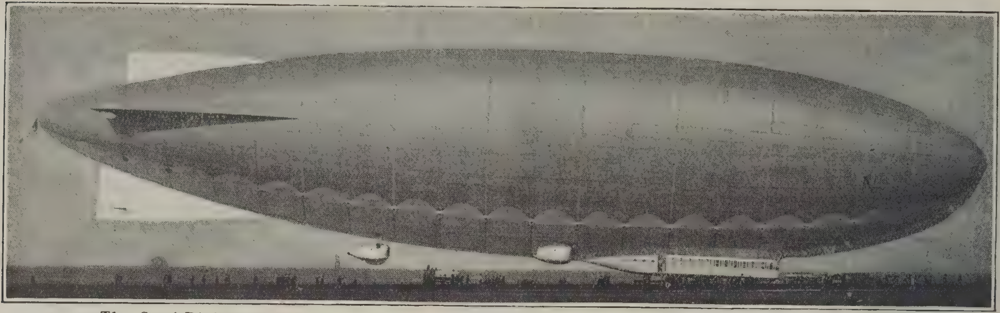
QUAKER FRIARS, BRISTOL
MIVART STREET, BRISTOL

THE ITALIAN AIRSHIP N.1.



The Semi-Rigid Italian Airship N.1 at Ciampino, the airship station between Rome and Frascati.

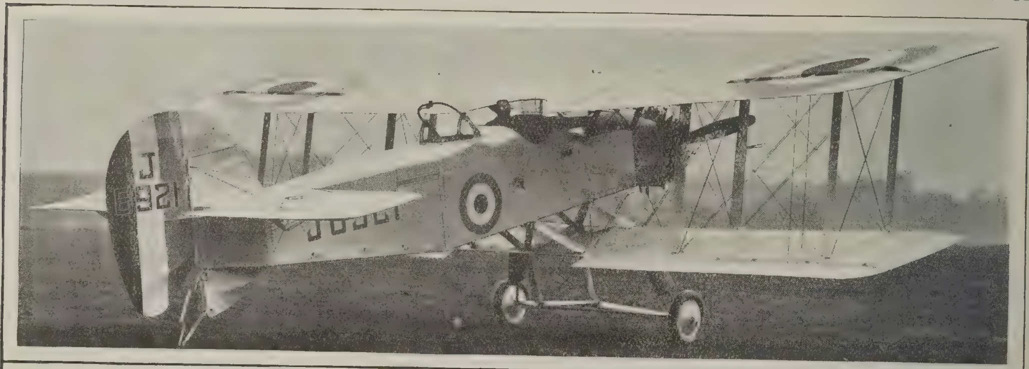
A photograph here reproduced shows the latest Italian semi-rigid airship N.1 on the occasion of her first trial at Ciampino on Mar. 1. This airship, which was designed and built at the Italian State Airship Factory at Rome under the direction of Ing. Umberto Nobile, is a development of the earlier type in which a pin-jointed triangular keel frame is used to relieve the envelope of compression loads, thus making it possible to use smaller gas pressures than would otherwise be necessary.

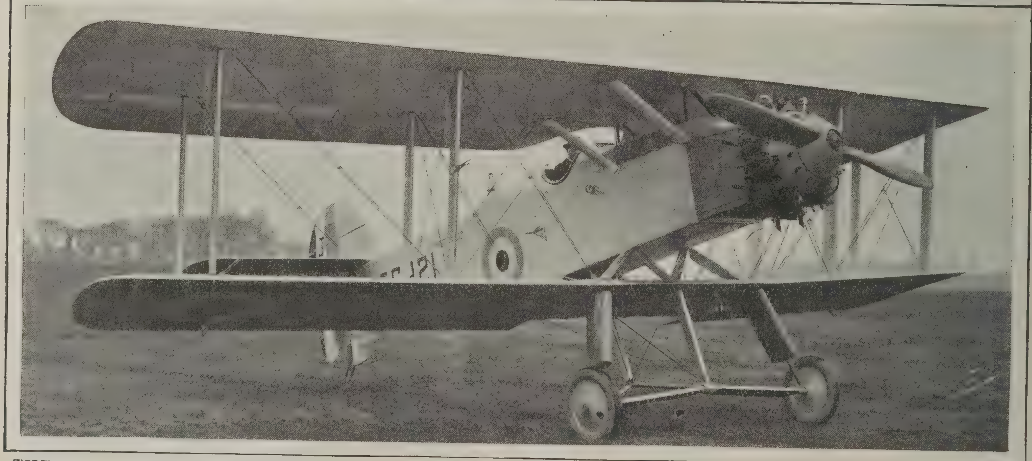
In N.1 the keel is extended fore and aft to form a rigid nose and tail structure, the tail stiffening serving to carry the stabilising and control surfaces. As is usual in this type of ship, the keel structure is attached to the envelope through a steel cable catenary system which relieves the envelope fabric of a large proportion of the tensile stresses which it would otherwise have to carry.

The N.1 has been equipped as a passenger carrier, and is fitted with one large combined control and passenger car mounted well forward. There is accommodation for 20 passengers in this car. Three engine nacelles, two side by side amidships and one below the keel aft, each carrying one 250 h.p. engine driving a propeller, are suspended from the keel by steel cables.

The main dimensions, etc., of the N.1 are :—

Capacity ...... 19,000 cub. m. (672,000 cub. ft.)
Length ..... 106 m. (348 ft.)
Max. height .... 26 m. (85 ft. 4 in.)
Max. width ... 9.5 m. (64 ft.)
Max. speed .... 100 km.h. (62 m.p.h.)
Useful cargo capacity ... 8,000 kg. (8 tons) appr.





THE ARMSTRONG WHITWORTH WOLF (350 Armstrong -Siddeley Jaguar engine), another two-seater Corps Reconnaissance machine. It would appear that unusual undercarriages are essential in this class of machine, but in other respects the Wolf appears to be of conventional design remotely reminiscent of a Bristol Fighter.

ESTABLISHED 1912.

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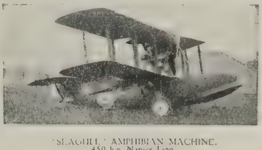
"SEA LION II" SINGLE SEATER AMPHIBIAN.
450 h.p. Napier Lion. Winner of the International Race for the Schneider Cup at Naples, 1922.



"SEAGULL" AMPHIBIAN MACHINE.
450 h.p. Napier Lion.

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Two 360 h.p. Rolls Royce Eagle IXs.

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Telegrams:—"Propellers, Leeds." Telephone:—601 Roundhay.

The Proposed Plymouth-Manchester Service.

It will be remembered that some months ago an aeroplane flown by Col. G. L. P. Henderson, was flown from Plymouth to London, carrying dummy mails picked up at Plymouth Sound. These mails left Plymouth at 6.45 a.m. and reached London in time to be delivered on the Continent the same afternoon.

Later a similar flight was made between Plymouth and Manchester with equal success. The object of these tests was to show how considerable an acceleration of the delivery of sea-borne incoming mails could be effected by using Plymouth rather than Southampton as a port for debarcation and the use of modern methods for the transport of mails from Plymouth to the main distributing centres.

An experimental service between Plymouth and Belfast, run by the de Havilland Company for the Air Ministry, also served to emphasise the saving of time in the delivery of mails which could be effected by the use of the aeroplane.

For nearly thirty years Plymouth has made every endeavour to attract the fast transatlantic liners to drop their mails there rather than at Southampton, on the ground of the acceleration in delivery that could thus be effected, even using railway overland transport, and the business community of Plymouth are to be congratulated upon having realised how very much the advent of practical air transport has strengthened their case in this matter. The demonstrations to which reference has been made were arranged and paid for by representatives of Plymouth, and their success was such that it led to negotiations between the local authorities and in the first place the de Havilland firm for the establishment of a regular service from Plymouth to Manchester and possibly also to London.

The negotiations have since been taken over by the Aircraft Operating Co., Ltd., the chairman of which is Mr. Alan S. Butler and the managing director Major H. Hemming. Major Hemming has now made to Plymouth a definite offer to operate a return service between Plymouth and Manchester, calling at Cardiff and Birmingham, on 275 days in each year in return for an annual payment of £16,500.

The machines which would be used would be of the D.H.50 type, carrying either four passengers or 1,000 lbs. of mail or goods. The payment of £16,500 per annum—£60 per return journey Plymouth-Manchester—amounts to £7 10s. per passenger or 7.2d. per lb. of goods for the single trip if the service runs fully loaded, £10 per passenger and 9.6d. per lb. at three-quarters full load, and £15 per passenger and 14.4d. per lb. at half load.

This price does not cover the provision of the necessary aerodrome and its equipment and organisation at Plymouth which it is assumed will be provided by the local authorities but it covers the whole payment to the operating Company for providing machines and pilots and running the service. Any revenue earned by the service over and above the £16,500 would belong to the local organisation or organisations who may participate in the scheme.

The Mayor of Plymouth who is extremely interested in aviation and has enthusiastically supported the scheme for a service of this type is now investigating the possibility of purchasing suitable land for an aerodrome. It has been suggested that the Plymouth Chamber of Commerce shall approach the Chambers of Commerce of Manchester, Birmingham, Cardiff and Belfast with a view to a joint meeting to consider ways and means of promoting an air service.

It is pointed out that the scheme submitted by the Aircraft Operating Company—if the cost were divided among the towns of Plymouth, Cardiff, Birmingham and Manchester—would cost each of them a very small sum, considering the advantages to trade which the service could render and the advertisement to their enterprise which it would give. It is also believed that the opening of a new aerodrome at Plymouth would not be without interest to the Royal Air Force, and hopes are entertained that the Air Ministry may be persuaded to this effect.

The recent report of the Air Mail Committee—which rather disparaged the utility of mail-carrying air services inside Great Britain—has in no way discouraged the interest taken in this project in Plymouth. It is felt that the Committee failed to grasp the inwardness of the Plymouth experiments which is that such a service as is proposed would induce the fast mail steamers which now call at Southampton to put into Plymouth instead. It is not supposed that the air service would permit mails carried on the slower ships which now call at Plymouth to compete in time of delivery with those carried on the faster ships to Southampton, but it is obvious that the combined saving of the time required to steam to Southampton rather than Plymouth with that saved in overland transport by the use of the aeroplane would justify this service.

It may be hoped that the present negotiations whether they materialise along the lines now in contemplation or not, will at least lead to the establishment of some form of inland service in this country. What is quite certain is that so long as no such service exists, officially appointed Committees, and directors of Government-aided air transport companies will be able to find many reasons why air services which might be of real use to this country cannot possibly be made to pay.

The Institution of Aeronautical Engineers.

The Annual Meeting of the Institution of Aeronautical Engineers will be held on Thursday, Mar. 20, at the Engineers' Club, Coventry Street, W.1, at 6.30 p.m. The business of the meeting will open with the Chairman's speech on the last year's work and the presentation of the Annual Report and Balance-sheet.

At 7.0 p.m. Lt.-Col. J. T. C. Moore-Brabazon will give his Presidential address and this will be followed by a Paper on Empire Communications, my A. H. Ashbolt, Esq., Agent-General for Tasmania.

The meeting will be open to non-members as from 7.0 p.m.

On Wednesday, Mar. 26, at 3 p.m., a visit to the Instrument Works of S. Smith and Sons (M.A.) Ld., has been arranged. Members desiring to take part in this visit are requested to give the Secretary the longest possible notice.

Rubber Shock Absorbers.

In a paper read before the Institution of Aeronautical Engineers, Mr. Rowland, of Turner, Luke and Co., described the manufacture of braided rubber shock absorbers, both of the normal type and of the unit ring type.

India-rubber itself has a stress-strain curve of a very curious character. At low loads the extension increases very rapidly with increasing load. After a certain extension, however, the extension corresponding to a given increase of load decreases very rapidly. The early part of the extension range of a rubber shock absorber has qualities fitting it admirably for cushioning against taxying shocks, but this "soft" range is too long to be used in practice. That is to say, that if the rubber were used unstretched before the weight of the machine came upon it, either the total extension of the rubber in use would be enormous, or a very large quantity of rubber would have to be used, and when a landing load took the rubber beyond the "soft" range the rubber would be unduly unyielding.

The braiding of the shock absorber serves in the first place as a protection to the rubber itself, and in the second place to hold the rubber under an initial stretch, and thus permitting the use of the best part of the stress-strain curve. The paper gives much interesting information as to the difficulties to be overcome in producing shock absorbers giving the most desirable characteristics and will be found to be well worth reading when it appears in the Minutes.

Gliders at Glasgow.

In a paper read before the Scottish Branch of the Royal Aeronautical Society Capt. Sayers outlined the history of gliders from their use by the Wright Brothers in the development of the first power-driven aeroplane up to the latest developments in Germany, France and England.

The light aeroplane was considered as a development from glider practice, and it was suggested that the success of the light aeroplane, far from being a reason for abandoning gliders, was rather an argument for their continued use, because the glider was freed from some of the practical limitations imposed by the presence of an engine, and in addition did not come under Air Navigation Regulations and therefore could be constructed and used at much less cost.

Gliding could be used to provide excellent sport and elementary training in flying provided proper facilities were available. In the South of England especially such facilities were not generally easily to be found, but the lecturer suggested that there were many excellent gliding sites easily accessible from Glasgow, and that Glasgow University and the Glasgow and West of Scotland Technical College might do many worse things than to follow the example of many German Technical Universities and form a gliding club or clubs.

New Technical Literature.

The International Air Congress, London, 1923. Report of Proceedings. Published at the Offices of the Royal Aeronautical Society, 7, Albemarle Street, London, W.1. Price 25s. net.

Company News.

MORTGAGES AND CHARGES.

BOURNEMOUTH AVIATION CO., LD.—Further charge on certain freehold lands, hereditaments and premises at Ensbury, Dorset (subject to prior charges), dated Feb. 18, 1924, to secure £200. Holder:—W. E. Tucker, Marlands, Yeovil, Somerset.

SATISFACTION.

BLACKBURN AEROPLANE AND MOTOR CO., LD.—Satisfaction in full on Feb. 11, 1924, of mortgage debenture dated Feb. 10, 1921, securing all moneys due or to become due from Co. to the Union Bank of Manchester, Ld.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 17; Tuesday, 17; Wednesday, 21; Tuesday, 18; Friday, 18; Saturday 17; Sunday, 6.

LONDON—PARIS—ZURICH :
Handley Page Transport, Ltd., machines 17, passengers 98, freight 6,550 lbs.
LONDON—OSTEND—COLOGNE :
Instone Air Line, Ltd., machines 19, passengers 40, freight 31,183 lbs.
MANCHESTER—LONDON—ROTTERDAM—AMSTERDAM—HANOVER—BERLIN :
Daimler Airway, machines 42, passengers 32.
PARIS—LONDON :
Air Union, machines 23, passengers 69, freight 8,462 lbs.
LONDON—ROTTERDAM :
K.L.M., machines 12, passengers 19.
SPECIAL MACHINES : Paris—London, machine 1, passenger 1.

Total number of trips by British machines : 79, carrying 171 pas. Foreign machines : 35, carrying 88 passengers.

COMPARATIVE FIGURES :
For week ending Mar. 16 :
Machines, 114; Passengers, 259; Crews, 194, Total personnel, 453.
Corresponding week, 1923 :
Machines, 67; Passengers, 207; Crews, 126; Total personnel, 333.
Corresponding week, 1922
Machines, 53; Passengers, 113; Crews, 88, Total personnel; 201.
Corresponding week, 1921 :
Machines, 35; Passengers, 92; Crews, 43; Total personnel, 135.

Croydon Notes.

The fine weather of the past week has caused a small boom in air traffic. 114 machines flew on the various services and over 250 passengers were carried, which is remarkable for the time of year. On Saturday Handley Page Transport Ltd. had to double their services owing to the influx of passengers.

Although no appointments have yet been made it is considered practically certain that Colonel Frank Searle will be made Managing Director of the Imperial Air Transport Company Ltd. and that Mr. Savage will be Chief Engineer.

Mrs. Atkey arrived at Croydon on Sunday piloting the D.H.9 on which she flew to Paris recently. The machine has been laid up there since its arrival with a leaking water-jacket. Mrs. Atkey had flown from Le Bourgêt to Lympne the previous evening.

On Thursday Mr. R. H. MacIntosh flew from London to Paris on W.8b G-EBBI in 1 hour 57 minutes. His actual flying time was 1 hour 46 minutes.

On Wednesday, three machines of the Daimler Airway covered 2,000 miles. One machine flew twice from London to Manchester and back, another made a return trip to Amsterdam and a third made a single trip to Berlin. The Manchester machine made the outward trip on both occasions in 75 minutes.

The Bristol Jupiter ten-seater has arrived at the aerodrome. It is understood that she is to be used by the Instone Air Line as a freighter.

Mr. Muir has been flying the Surrey Flying Services D.H.9 in the Midlands on photographic work. He arrived at Hendon on Friday night and had great difficulty in finding an aerodrome in the darkness but eventually he got down all right.

The Aircraft Disposal Company Ltd. has had a busy week. On Tuesday Mr. Perry was testing a Martinsyde and a Bristol. On Wednesday he gave a demonstration on the Martinsyde and a D.H.9a and later was testing the Bristol again. On Thursday he tested two more Bristols and on Friday he gave a demonstration on a Bristol and on Saturday he tested still another Bristol.

On Thursday a Fokker lost a wheel when taking off from the aerodrome. The pilot did not notice what had happened as the machine had just reached flying speed and got away all right. The passenger noticed it and wrote out a note to pass to the pilot. He decided however not to worry the pilot until he was about to land, which was a remarkably sound piece of reasoning. On arrival at Rotterdam, however, the machine was greeted with a flock of machines all the occupants of which were waving spare wheels and in addition to this the fact was written on the ground in white chalk telling the pilot of the mishap. He thereupon made a slow landing with the result that the machine pulled up on one axle undamaged.

The Franco-Roumaine Service.

Owing to the refusal of the German Government to enter into a convention which will permit aircraft belonging to the Compagnie Franco-Roumaine to cross over Bavaria on the way to Strasbourg and Prague *via* Nuremburg it has been decided that the machine leaving Strasbourg by this route shall proceed *via* Basel along the valley of the Rhine to Lake Constance and then *via* Innsbruk, Linz and Vienna.

The Daily Mail sees in the German Government's refusal further villainous action on the part of Germany in connection with the apochryphal secret ray for stopping magnetos and engines and wireless messages, "N'Everything" as the song said.

A Cold Experience.

An aeroplane from Riga to Helsingfors was forced to land on the ice in the Gulf of Finland on Feb. 23. The engine was damaged and two passengers and the pilot suffered exposure in a blinding snowstorm until rescued by an auxiliary aeroplane from Riga the next morning.

Canada and the Forest Patrol.

On Jan. 7-11 an important conference of Canadian federal and provincial forest officers was held in the Ottawa House of Commons when the vital question of forest fire protection was discussed in all its bearings.

In the full report of the conference first issued the following resolution, numbered 10, is of interest :—

> Whereas in many parts of Canada the use of aircraft offers the only possible solution of the problem of forest fire protection, and whereas the expenditure involved is beyond the financial means of forest authorities, Resolved that this Conference recommends that the Dominion Government should provide substantial assistance to the provinces either by donation of air service facilities or by subsidies to the provincial forest authorities sufficient to allow them to obtain service from commercial aircraft companies.

A Zeppelin for America.

Mr. Denby, the retiring Secretary of the U.S. Navy, announces that the Z.R.3 which is at present being completed in Germany for the U.S. Government will not begin its trans-Atlantic flight before the end of May.

Air Affairs in Parliament.

THE NAVY AT WAR AGAIN.

COMDR. BELLAIRS (C., MAIDSTONE) in the House of Commons on Mar. 17 asked the Prime Minister whether the arrangements made last year for the control, manning, and training of the Air Forces associated with the Navy were working satisfactorily; and whether naval requirements were being fully complied with.

MR. RAMSAY MACDONALD : The arrangements have not been put into operation owing to a disagreement as to the interpretation of and means of giving effect to the decisions. The Government have taken steps by which the matters in dispute may be adjudicated when the decisions in question must be put into operation.

Gerald Cranston's Malady.

Mr. Frankau in "Peter Jackson" produced one of the best war novels and has besides written several quite pleasing works. But "Gerald Cranston's Lady" is the type of book which is only worth keeping on a shelf alongside "If Winter Comes."

Those who must read the book will find much amusement in Chapter XVII, which deals with a supposed flight from London to Paris. The chapter contains more sheer ignorance to the square inch in its fifteen pages than one would have thought possible. One reads of Cranston seeing "a big Vickers-Vimy biplane with the long narrow cabin underslung between its yellow wings and the 'G.E.A.R.' painted in prominent white letters all over its blue fuselage." And again, "the mechanic loosed the single tractor screw of the Vickers-Vimy; and the sixteen cylinders of the four-hundred-and-fifty Napier Lion engine ceased their intermittent phutting." It strikes one that the mechanic also must have revolved a trifle before "loosing" the screw.

On the way to Paris they passed over Epsom Grand Stand. Presumably this was by special arrangement between Mr. Cranston and "the pilot-boy." Sometimes he becomes technical, as when he says, "Even when the plane struck its first air pocket, and—the di-hedral angle of the great wings altering automatically to stability—it seemed to her as though the cabin floor dropped from under her feet."

It seems that Mr. Frankau on his visit to Croydon was frightfully pleased with the word "conked" as applied to engine failure for he uses the word several times.

One sincerely hopes that Mr. Frankau will return to his earlier subjects and will give up writing about that of which he obviously knows nothing. Apart from which one may add that the book includes in a vastly exaggerated form every fault of grammar and style which has ever marred the good work which Mr. Frankau has done in the past. It was very unkind of Mr. Frankau to dedicate the book to Mr. and Mrs. Theodore Instone.

PERSONAL NOTICES.

DEATHS.

TILMAN.—On Mar. 11, accidentally killed on service, Kenneth Cromar Tilman, Flt. Lt., No. 442 Flight, R.A.F., husband of Montague Tilman and son of Mr. and Mrs Tilman, Wallasey, aged 27.

SHELLEY.—On Mar. 14, at Farnborough, as the result of a flying accident, Cpl. Shelley, of No. 1 F.T.S., Netheravon.

ENGAGEMENT.

LAWES—PARSONS.—The engagement is announced between Capt. E. H Lawes, M.B.E., of the British Gendarmerie, Palestine, eldest son of Mr. and Mrs. J. E Lawes, of Aldershot, and Gladys Kate, only child of Flg. Off. and Mrs. J. Parsons, R.A.F., Sarafrand, Palestine.

MARRIAGE.

SWAN-COOPER.—On Feb 15, at Portsmouth, H. Swan (late R.F.C. and R.A.F.), only son of Mr. Andrew Swan, Gorleston House, Hornchurch, to Edith, widow of Lieut J. Cooper, R.N.R., of Roker, Sunderland.

TENDER.

COUNTY BOROUGH OF BELFAST.

THE COUNTY BOROUGH COUNCIL OF BELFAST INVITE TENDERS for the SUPPLY and ERECTION of a HANGAR at Malone Aerodrome (3-4 miles from the Harbour).

Dimensions not less than 60 feet by 60 feet by 20 feet high, and not greater than 80 feet by 80 feet by 23 feet high. The price quoted to be for the Hangar erected complete at the Aerodrome and maintenance thereof for Six Calendar Months to the satisfaction of the General Purposes Committee of the Corporation or person authorised by them.

Tenders, endorsed "Tender for Hangar," giving full detailed Specification, with Drawings and guaranteed date of completion, and names and addresses of two sureties, much reach the undersigned not later than 12 o'clock on SATURDAY, Mar. 22.

Persons tendering must comply with the Council's Standing Orders relating to Wages, Hours of Labour, etc.

The lowest or any tender will not necessarily be accepted.

An official receipt must be obtained for every tender delivered by hand. Tenders sent by post should be registered.

The person whose tender is accepted will be required to enter into a written agreement for the fulfilment of the contract to be secured by the joint and several bond of his sureties in the sum of £500. R. MEYER, Town Clerk.

FOR SALE.

TRANSFERS.—Firms requiring transfers should write to the makers.—A. Bird and Co., Latimer Street, Birmingham

SPARE PARTS for Puma, Hispano, Le Rhone, Clerget, Mono, Beardmore, Rolls and other engines; fine stock of special tools; A.G.S. Ignition Parts Lowest prices in the Trade.—Apply, Northern Engineers, Canning Town, West Ham. Phone: Maryland 1909

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MISCELLANEOUS.

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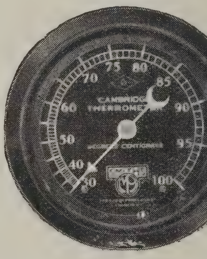

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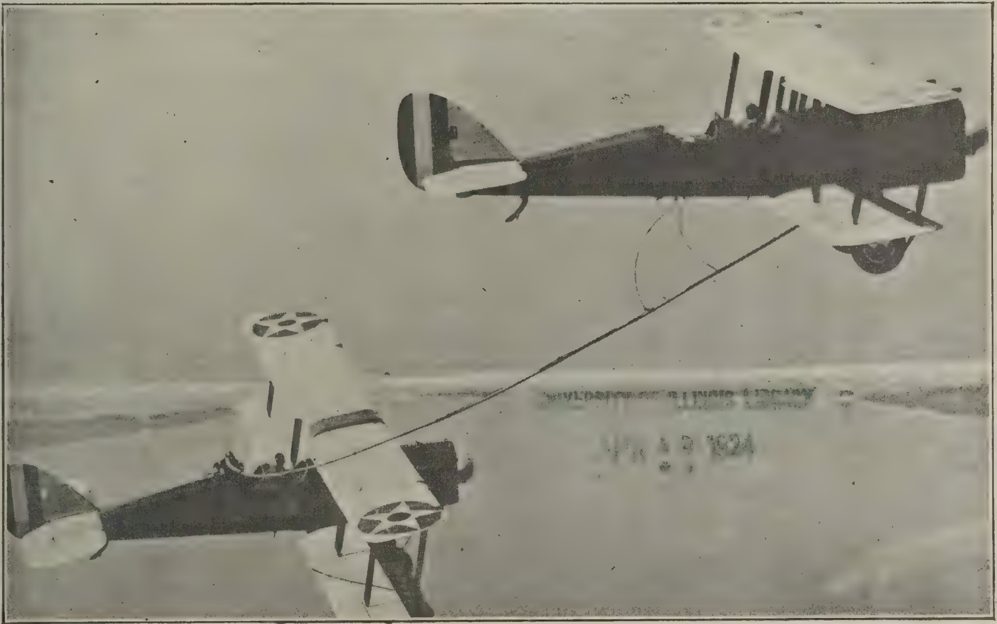

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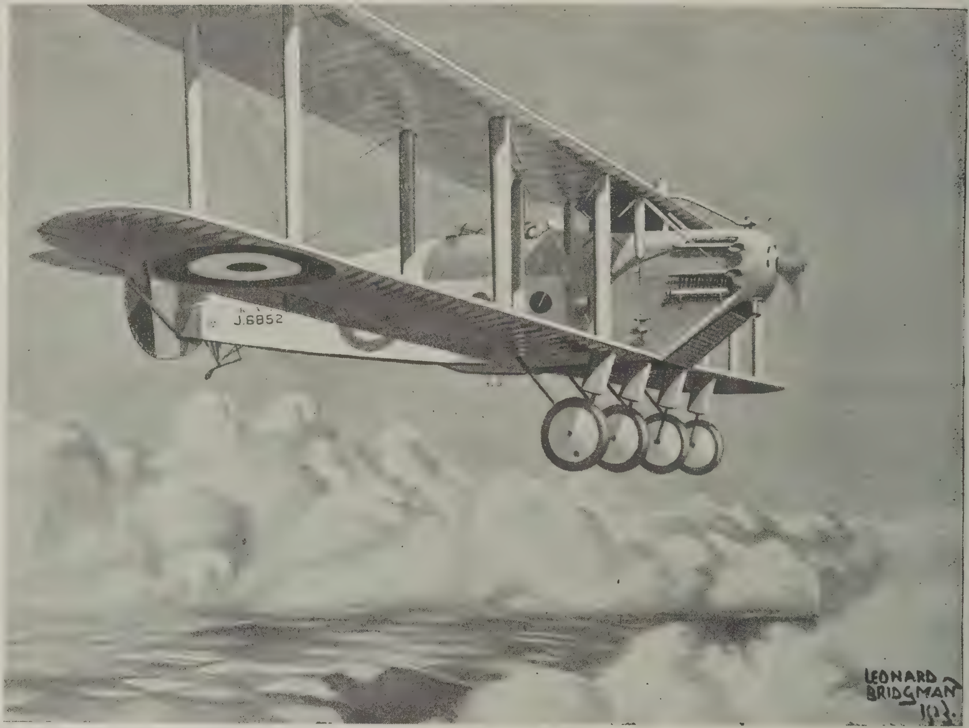

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ON AUSTRALIA AND THE FAR EASTERN DEFENCES.

It would appear from recent evidence that the more intelligent people of Australia are awaking to the importance of adequate defence against Japanese aggression.

On Mar. 20 a dinner was given in the Federal Parliament House at Melbourne to Vice-Admiral Field and the officers of the Special Service Squadron R.N. which has recently been "showing the flag" on the high seas. At that dinner Mr. Bruce, the Australian Premier, referring to the British Government's decision to abandon the project for a first-class Naval dockyard at Singapore, remarked in effect that although the Singapore scheme appeared to the British Government as likely to create suspicion and antagonism and as destructive of that international confidence which must precede the reduction of armaments the same Government did not seem to regard an increased Air Force as provocative. Mr. Bruce added that it was difficult to draw a distinction and it was more difficult to avoid a suspicion that a problem close at hand (namely the Home Defence Air Force) received more attention than one that was far away (as was Singapore).

Further Mr. Bruce welcomed the recognition by Mr. MacDonald of the necessity for co-operation in Imperial Defence between Great Britain and the Overseas Dominions. He said that Australia would always be ready to consider plans for co-operation.

Vice-Admiral Field in reply advised Australia to build cruisers and submarines to assist in the defence of the trade routes. And he also advised Australia to establish a naval base of her own, preferably in the North West. He remarked that Port Darwin seemed designed by Providence for the purpose.

Such remarks by two such distinguished personages call for particular attention, especially from those who are concerned with aircraft, for in each case the speaker has displayed a curious obliquity of mental vision. Perhaps one should rather describe their outslook as short-sightedness plus astigmatism—in that they not only do not see far enough but they cannot see the right lines of Australian defence. It is however interesting to see that Admiral Field fixes on Port Darwin as the chief defence base, for readers of this paper will remember that a similar recommendation was made in the recent articles on "Singapore and the Oil Supply."

In the first place it is well to remember that a matter of two or three years ago the Australian Government of the period conceived the eminently sensible idea that Australia could be defended against Japanese aggression by an adequate Air Force. The intention was to form squadrons of seaplanes for coast defence, and a few machines were ordered as a nucleus for what should in time become such a force of torpedo-droppers and bombers as would prevent any hostile fleet of warships from coming within a hundred miles of the coast.

Since then the scheme seems to have been dropped and the Royal Australian Air Force of to-day seems to have sunk, in the purely political sense, to about the importance of a parish pump. One believes that a training station still exists at Point Cook, but nothing much seems to be done there and certainly the R.A.A.F. does not possess any aircraft of more recent design than 1916, except for two or three seaplanes of 1917 vintage bought in 1922 or thereabouts. And this is so despite the fact that for the price of a single cruiser Australia could equip an Air Force capable of stopping the approach of a Battle Fleet.

As to Mr. Bruce's suspicion that a problem close at hand receives more attention than one that is far away, he is probably quite right. It is obvious that when we become involved in a first-class World War it will be far more important to defend our 48 million people in the British Isles than to defend the 4 million people in Australia, especially in the esteem of Governments which defend largely on feminine votes. In other words, if one may be permitted a frivolous paraphrase, "A bird in the Strand is worth two (or more) in the Bush."

Apart from which, if the Japanese did capture part of Australia and did occupy it temporarily it would make little or no difference to the conduct of the war on the West Front, or even in the Malay Archipelago (beyond giving the Japanese a shore base for their aircraft). But if Great Britain were left short of air defence in order to protect Australia the effect on our output of munitions would be serious and the progress of the war would be considerably hampered. Therefore there seems all the more reason why Australia should set about expanding the Royal Australian Air Force and equipping it with aircraft which will make it a useful fighting force in the coming war instead of merely giving it uniforms which make it ornamental in time of peace.

Mr. Bruce's jeer at our Government for regarding the Singapore dockyard as provocative and the increased Air Force as otherwise is unworthy of a man of his intelligence—even to an after-dinner audience. One imagines that the motive behind our Government's decision is economy in the Service Estimates. Our Labour Cabinet is at any rate intelligent and it seems to have decided that a big Air Force costs less than does a mediocre Navy and affords much better defence for less money.

A million pounds a year spent on a dock-yard at Singapore would provide far less actual defence than would the same money spent on aircraft. And if the Air Ministry can manage to carry out the Singapore Aerodrome scheme we can very well do without the Singapore Dockyard.

Besides which, as one indicated a week or two since, it is purely foolish to build a dockyard just where it can be most easily bombed. If the Admiralty wants a dry-dock for ships of the Hood class it ought to be at some point where it is less liable to attack, say at Colombo or on the coast of Burma.

Lastly there is Admiral Field's bad advice that Australia should build cruisers and submarines to defend the trade routes. Every man to his trade, of course, and naturally an admiral would advocate the buildings of ships. But no money that Australia's 4,000,000 people could afford would build enough cruisers to protect her shipping routes against Japanese attack. And anyhow the War 1914-18 proved that cruisers and destroyers are practically useless for convoy work against a determined submarine service—and the Japanese submarine personnel are very determined.

On the other hand it was proved that aircraft escorts are an absolute protection against raids on convoys. It is necessary here to repeat the statement that for a period during the War 1914-18 when convoys were run from Marseilles to Egypt without any escort other than aircraft they never lost a ship and were never even attacked whereas during the same period the convoys from Gibraltar to Egypt which were under Naval escort without aircraft never got through without more or less serious loss.

The Australian shipping routes are all within very easy flying distance of the coast, chiefly from Torres Strait down the Great Barrier Reef, or down the West Coast where there is little chance of attack. The New Zealand route can be covered by air patrols from each end meeting halfway. Therefore all Australian shipping can be convoyed by aircraft at a cost which is well within the means of the Australian people.

Australia can also afford to build and maintain an air fleet which is capable of defending her coasts against any detachment of the Japanese Navy which is likely to be sent against her. And Australia has plenty of people fit to man such an air fleet, for there are no finer air fighters than are the Australians. Consequently Australia's ability to defend herself and her trade routes without help from an overburdened Mother Country is not a matter of money or men but purely a matter of the intelligence of her politicians.

There is a favourite saying among Australians that their national motto is, "Get up every morning with a clear conscience, look every man straight in the eye—and tell him to go to Hell!" Let Australia apply that principle to the building of her Air Force and she need have no fear either of Japanese aggression or of English retrogression.—C. G. G.

MORE AIR DEBATES.

By C. G. GREY.

There is a story of a certain man who had been spending an evening with a celebrity who was noted for his loquacity. Speaking of his experience to a friend he said "And d'you know, he talked from eight till twelve without stopping?" "What on earth did he talk about?" asked the friend. "He didn't tell us," replied the victim.

These interminable Air Debates from which Parliament has suffered during the past few weeks recall that story. They remind one also of Pope's famous couplet—"A lingering Alexandrine ends the song, which like a wounded snake drags its slow length along." One feels sure that the majority of M.P.'s must have been brought up on Alexandrine verse, for hardly ever do they fail to make three words grow where one would have made such sense as they were capable of expressing.

Nevertheless it is necessary for purely historical reasons to record these debates in The Aeroplane so that such facts or opinions as were expressed may become known to those who are concerned with aeronautics. Therefore with due apologies one inflicts the following précis of the week's talk on one's long-suffering readers.

The Navy Estimates.

The Navy Estimates were presented to the House on Mar. 18, by the Parliamentary Secretary to the Admiralty, **Mr. Ammon**. His first reference to aircraft was a statement that it had not been found possible to put into operation the arrangements recommended by the National and Imperial Defence Committee for co-operation between the Navy and the Air Force as the two Services had not come to an agreement as to the interpretation of and means of giving effect to the decisions of the Committee. Mr. Ammon said:—

> For the elucidation of the points at issue the Government have just made arrangements which they hope may shortly enable the decisions in question to be put into operation, but even then some time must in all probability elapse before the question can be finally settled.

Replying to Capt. Wedgwood Benn, Mr. Ammon said that he would rather not say whether the objections came from the Admiralty or the Air Ministry.

Referring to the Singapore base, Mr. Ammon said:—

> This matter has engaged the close and earnest consideration of the Government as one involving questions of much wider implication than that of naval strategy. After full consideration of all the relevant facts and consultation with the Dominions Overseas, the Government have decided not to proceed further with the Singapore scheme.

These were the only references to the Admiralty's representative to matters of direct interest to the Air Force. It is fairly evident that the difficulties about the working of the arrangements recommended by the National and Imperial Defence Committee have been raised by the Admiralty, which has metaphorically dug in its toes and refused flatly to co-operate with the Air Ministry. In the matter of the Singapore base the Government has merely made a definite decision not to build a new dock at Singapore. That is an economy which may very easily be thoroughly justified. So long as Singapore remains an important naval station and if it should be developed as a still more important air force base we can still secure our position in the Far East.

Mr. Amery, formerly First Lord of the Admiralty, raised the question of the Navy's paying for the Fleet Air Arm. He said:—

> Coming back again to the Estimates, there is one very important omission to which I should like to draw attention, and that is the omission from the Estimates of the cost of the Fleet Air Arm. I think it was understood—I certainly understood it—that, as an outcome of the discussions and of the Cabinet decision last summer, it was definitely settled that the cost of the Fleet Air Arm should figure upon the naval Votes, and should be debited to the Navy as the user Service. I fully realise that at the present time discussions are proceeding between the Admiralty and the Air Ministry, which the Government are taking into consideration, as to the precise interpretation of the detailed recommendations of Lord Balfour's Committee. . . . But whatever the precise extent which that Committee intended that the Air Ministry or the Admiralty should be responsible for supply, personnel, the training of personnel, at any rate on shore, and the supply of material, I think that in all its recommendations, as I read them, there was the underlying assumption that for combatant purposes, for the purpose of the use of the Fleet Air Arm, the Air Arm was a portion of the Navy.
>
> If that be so it is desirable, if the House and the country are to understand what the total costs of our naval commitments are, that the Fleet Air Arm should figure upon the Naval Estimates. That raises an underlying question of principle, which I trust the Government will be clear about when they deal with these various matters of detail, and I hope we may have an assurance from the hon. Member that when the outstanding points are settled, and however they may be settled, the actual cost of the Fleet Air Arm will be presented with the Navy Estimates.

The subject of airships was also mentioned by Mr. Amery who said:—

> I regret greatly the decision, which the Government have apparently come to, to go back on the proposal that was under the consideration of the late Government, namely, to encourage private enterprise in airships so that if ever, and whenever, a war might come there would be the largest possible number of airships available to supplement the work of cruisers over the great stretches of ocean. We can never have enough cruisers on those great stretches, but we can save an enormous amount of work of the cruisers if, with these cruisers, we have co-ordinated a group of airships with the immense advantages of the wide field of vision and of speed which they enjoy.

It would appear that Mr. Amery really does know something about strategy in relation to the Navy, for he delievered a lengthy but quite intelligent dissertation on the subject He pointed out that the reason for our concentration of naval force (he did not mention air force) at Malta was not because Malta was near France or Italy, but because it was so centrally situated on the main highway of the British Empire between England and the Far East and that this was essential now that we were reduced to one battle fleet instead of having as we formerly had one of our biggest battle fleets in the Pacific even when we were allies with Japan and practically allies with Russia and when nobody suggested that there was any menace in that part of the World. Singapore was to have been the headquarters of an enlarged Pacific fleet.

He brought out the interesting fact that although the Government had dropped the Singapore dock scheme there was provision in these Estimates for a sum of £200,000 for the provision of oil fuelling at Singapore. As to the importance of Singapore Mr. Amery produced most of the points emphasised in the recent series of articles in this paper on Singapore and the oil supply. Moreover he pointed out that something like £1,000,000,000 worth of our traffic and a great deal of other traffic belonging to the rest of the Empire passed through the area controlled from Singapore every year and that at any minute something like £160,000,000 worth of our ships and cargo were afloat in that ocean.

One does not imagine that the Japanese will be very much deceived by Mr. Amery's argument that Singapore is no more a menace to Japan than Plymouth is a menace to the United States or Key West to us and his question "After all if we wanted a menace to Japan why give up that splendid defensive position at Hong Kong?" will merely give the Japanese to smile, for they know perfectly well that in a great sea war it would be impossible to defend Hong Kong because there is no land communication with it and it could only be supplied by sea across miles of ocean where supply ships would be liable to attack. And anyhow Hong Kong does not defend any area which is of value to us but is merely an isolated point surrounded by hostile sea and flanked by hostile country.

Mr. G. Lambert, associating himself with the policy of the Government, said that it was not a question of obliterating Singapore, it was a question of putting down two battleship docks at Singapore a proposal which was one of the most complete follies ever put before the House. Mr. Lambert also wanted to know why the Navy did not pay for its own air force. He wanted to put two distinguished air officers on the Board of Admiralty and some "air experts" on the naval staff. That at any rate seems a sensible suggestion because if put into effect it might serve considerably to enlighten the Navy. On the other hand Mr. Lambert said that the Navy had a wealth of technical knowledge that could well be placed at the disposal of the Air Force. On this subject one has grave doubts though it is possible that one or two intelligent naval engineers might find more scope for their ability if transferred to the Air Force.

The Prime Minister, **Mr. Ramsay MacDonald**, cast further light on the Singapore question by saying:—

> The fact of the matter is that Singapore at the present moment is a very efficient dockyard, and the proposal that was made was not to create a dockyard there, but to extend it in order to enable it to fulfil certain new functions. That is all the point at issue.

From this it may be judged that the whole of the Navy's case rests on a false premise. Apparently all that the Navy wants is to build an enormous dockyard which can be very easily bombed, whereas the proper function of Singapore is to act as a strategic supply base for air and sea forces operating between the Malay Straits and Australia.

Mr. MacDonald then quoted a document which is shortly to be published from which it was clear that Australia, New Zealand and Newfoundland wished the British Government to proceed with the base, the Canadian Government wished to refrain from offering any advice on the problem and the Irish Free State had adopted a similar attitude—a statement which naturally caused laughter. South Africa, by the voice of General Smuts, approved the Government policy as "a bold move towards enduring peace." General Smuts it may be remarked is an extremely astute lawyer and probably

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knows quite well that by renouncing the dockyard extension we lose nothing and that by making a very loud song about our renunciation we may be able to deceive the ignorant of other nations.

Mr. MacDonald made one excellent point when he spoke as follows :—

> I know perfectly well if I have to go into negotiations on that point and said, "I am building, but I will stop," far more suspicion would come out of the tail of the eye of my rival on the other side of the table than if I went and said, "I come to make an agreement with you, and if I cannot get it, I will have to begin developing my base." So far as actual advantage is concerned, it is quite as good as the other, but as far as moral sincerity is concerned it is ten million times stronger.

One certainly agrees that the threat to start building is far more effective than the promise to stop. It is precisely the kind of militant argument which one could expect from a pacifist.

Lieut.-Commdr. Fletcher made the interesting and amusing point that it was very difficult to say where the heart of the Empire really was but that if the heart of the Empire were menaced the stomach of the Empire might also be menaced if we had no adequate provision to protect our trade routes.

Viscount Curzon, who invariably gets hold of the wrong end of an argument, tried to make great play with new Italian ships which have a speed of 34½ knots and have a main battery of 8.7 guns and actually carried two aeroplanes each. One had almost hoped that the idea of carrying aircraft on ordinary fighting ships had been forsaken even by the naval intelligence.

Capt. Benn who occasionally says a good thing remarked apropos the subsidy disagreement between the Sea Lords and the Government.

> I would like to have a return made by the Prime Minister showing how many times the Board of Admiralty have threatened to resign during the last 20 years. Admirals who will sweep the foes from the face of the sea in time of war, spend their leisure in time of peace writing letters of resignation.

Altogether 127 columns of Hansard were spoken.

The Air Ministry Again.

Prior to the debate in Committee of Supply on Mar. 20 sundry questions were asked about the Air Ministry. A Mr. Harris wanted to know why only 25 per cent. of the authorised staff in the Department of Works and Buildings was on an established footing and why all these posts were filled by regular Civil Servants whereas the other 75 per cent. were temporary appointments held by technical ex-Service men. Mr. Leach's reply was the obvious one that Works and Buildings exist under abnormal conditions and that the permanent appointments had to be restricted to 25 per cent.

Thereafter Viscount Wolmer wanted to know why Mr. Leach had refused to receive a deputation from the Cove branch of the British Legion which is composed entirely of employees of the Royal Aircraft Establishment at Farnborough of ex-service men. Mr. Leach replied that it was not in the interests of good administraton that employees of the department should be encouraged to approach Ministers by means of deputations from the British Legion or any other Association until their grievances had been dealt with by the machinery set up for the purpose, namely, the Whitley Councils, or where they have elected not to avail themselves of the Whitley machinery by representation through the officers under whom they serve.

Viscount Wolmer wanted to know whether Mr. Leach wished to force these men to approach him through their trades unions and Mr. Will Thorne asked whether Mr. Leach was aware that most of these men were members of trade unions and Sir Samuel Hoare said that all previous Secretaries of State for Air had found it most useful to receive representatives of the British Legion. Finally the Marquess of Hartington asked whether the marked disfavour which the honourable Gentleman showed towards the British Legion was on account of the fact that they served their country during the War.

In reply to Sir E. Hume Williams Mr. Leach said that it would be necessary to construct some new aerodromes to accommodate the contemplated increase in the Air Force. He said that the majority of the aerodromes would be inland but a few would be required near the coast. He stated further that some of the wartime aerodromes which are still in existence would be reopened in preference to acquiring new sites wherever this course was the more economical.

The Committee of Supply.

Sir Geoffrey Butler of Cambridge University opened the Debate in a speech occupying six-and-a-half columns of Hansard and touching with literary charm on the unemployment of time-expired Short Service officers and on the perennial subject of Government neglect of research. He deserves thanks for one delightful phrase :—

> I do assert that to attempt to organise research work from a Government department is to attempt the impossible. After all research is an attitude of mind. Research is an insight into the workings of the laws of nature and you cannot possibly measure that off as you might measure off butter by the inch.

Lt.-Col. Meyler speaking "as one who had the privilege to serve with the Air Force for four-and-a-half years" spoke five columns of Hansard and showed that he had not seriously considered the next war. He rejoiced in the fact that we had great engineering works in Scotland and Northern Ireland which would be useful in case of emergency to turn out a vast number of aircraft and he seemed to think that the works in the South of England and on the East coast would be in danger. It has evidently not yet occurred to him that very probably in the next war it will be the Scottish engineering centres which will suffer most. He also put in a good word for the much neglected kite-balloon, pointing out that an attack by five divisions of the German army was on one occasion defeated by the observations of one man made on a day when aeroplanes could not fly.

Mr. Mosley spoke four columns largely on the imagined frightfulness of the next war. He also delivered a series of statements on the uselessness of aeroplanes as defence against aeroplanes showing that he has made some attempt to understand air problems and has unfortunately failed.

One of his amusing ideas is contained in the phrase "They talk about our machines bombarding enemy aerodromes but surely it is recognised that in the next war the hangars of enemy aeroplanes will be situated far underground." One merely wonders how many miles of tunnelling would be necessary to house an air fleet of such size as to be of any value whatever for the bombing of enemy industrial centres It will be sufficiently difficult to find enough ground on which to stand them.

Mr. Mosley appeared to have hankerings after international conversion to peace. One would advise him together with the pacifists in Parliament to make an unconducted tour in Central Asia.

Major-General Seely limited himself to little over two columns, in which he said a good deal of what he has said before on many occasions.

Lt.-Commdr. Burney hit on a very good idea though he expressed it a trifle obscurely. It amounted to an argument that although two contiguous countries may keep the peace by agreement, because it is impossible for each to safeguard itself against aeroplane attack by the other, countries which are not contiguous cannot be induced to keep the peace by such an argument. He said quite boldly :—

> If one considers the Japanese Empire I do not think that any consideration of aeroplane attack would alter the World policy of a World power of that kind. Therefore, I think we have to consider our defences on two planes, one the Continental plane and the other the Imperial plane.

He also coined the very useful phrase "Orientational unemployment," meaning that there are certain stages in the World's history when there is a re-orientation of trading power which causes unemployment. He advocated the acceleration of World communication by aircraft as a means of readjusting trade for our benefit and he backed up his argument with an essay on economics which is really well worth reading. One only regrets that it is impossible to reproduce it here.

He also emphasised the fact that owing to the destruction of the German Navy the focal point of naval power has shifted to the Pacific and that we shall require a greater Navy than we ever had before because of the greater area in which we shall have to operate. In order to give that Navy an opportunity of being efficient he advocated the revival of the airship for patrol work.

Lt.-Commdr. Kenworthy, who said that he was by way of being an Indian Merchant (one had always suspected him of being a Russian merchant), also advocated speeding up communications with the East. He inquired (one imagines in humorous vein) as to what it was proposed to do about the defence of our dockyards in case of a war with France. He then argued that there are not enough officers who fly in proportion to the total number in the Air Force. He fell into a common error in saying "You can increase the staff much more easily than you can increase the fighting portion of the air service." Having been brought up as a regular naval officer there is perhaps some excuse for his ignorance on this point, for it will be remembered the Navy had practically no Staff before the War 1914-18 which accounts for what the Navy did not do in the Great War.

Mr. Kenworthy fell into another error in saying "It is almost impossible for a poor boy however clever, however suitable or however obviously useful for the air service to enter the Air Force unless his father was an officer who fell in action." Mr. Kenworthy evidently does not know of the Wakefield Scholarships at Cranwell, nor does he know that during the past twelve months four aircraft apprentices from the Boys' Wing at Cranwell were awarded cadetships. One

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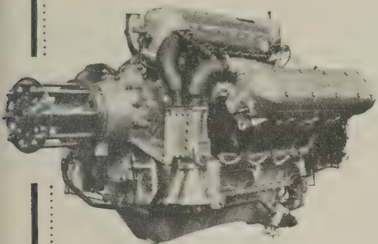
Aero Engines



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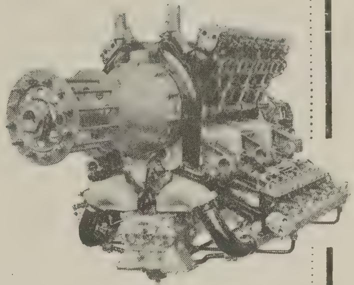

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of the great ideas of the Air Council is that a really clever poor boy can get a permanent commission in the Air Force. And for the matter of that a poor boy, if he be of the right stamp, can get a short service commission and if he be clever enough has at any rate a sporting chance of having that commission made permanent.

Lt.-Col. Moore-Brabazon talked humorous commonsense for four columns but made no strikingly new point. He did however issue a useful warning against trying to use existing airships as a test of the utility of airship services. He pointed out that if we did so we should give the impression that they were a failure. He also asked how it was that the money voted last year for new aircraft was not spent. And he advocated greater freedom for the Aircraft Industry in the design of new machines.

Mr. Hardie talked much of the usual democratic and pacifist nonsense about slaughtering innocent women and children.

Sir John Simon spoke ten columns, mostly devoted to arguments on the international law of bombarding undefended positions from which one finds difficulty in gathering whether he regards bombing as a military necessity or a moral offence or a legal liability.

Sir Harry Brittain devoted something over one column to advocating the claims of Prague to attention as an aeronautical centre, which is interesting in view of a letter recently published in The Aeroplane pointing out the defects of Prague from a pilot's point of view. Sir Harry also pointed out the delay which has occurred in producing new types of aeroplanes and engines.

Sir Samuel Hoare in four columns stood up gallantly fo the general policy of the Air Council. He also wanted know whether the new Government was pressing on th proposals for Imperial co-operation with the Oversea Dominions.

Capt. Eden lamented the fact that only nineteen officer from the Army and none from the Navy had been seconde to the Air Force in the past year.

Mr. Leach made a very adequate defence of the Goverr ment's air policy, or rather of the actions of the permanen officials at the Air Ministry, in the course of six columns bu said nothing really new.

Capt. Benn rising for the second time lamented tha although we had had three air debates we could not have an statement that the Government was taking some definit steps towards some pact or agreement for mutual air disarmament.

Rear-Admiral Sueter, who had evidently studied the Estimates more carefully than anybody else, dealt at some lengt with figures involved. He lamented the neglect of airships He wished to know why the R.A.F. needed horses. He aske whether all the money voted last year for new aeroplanes an engines had been spent and i fnot why not? He demanded list of the fighting machines in possession of the Air Force Also he wanted to know what we got for the £500,000 spen at Farnborough.

Mr. Leach admitted that Admiral Sueter's questions were interesting and should receive an answer, and promised to give a proper reply to them in the report stage of the Estimates.

The Start of the British World Flight.

Squadron Leader A. S. C. MacLaren accompanied by Flying Officer W. N. Plenderleith and Sergeant Andrews left Calshot Air Station in the early afternoon of yesterday, Tuesday, just as this paper was going to press. The machine is a Vickers Vulture, G-EBHO. It is driven by a 450 h.p. Napier Lion engine. The fuel supplies have been arranged by the Asiatic Petroleum Co. Ltd., for whom Shell-Mex Ltd. are the distributing agents in this country.

The machine was delivered to Calshot on Monday and is quite new. Practice has been carried out on a similar machine which has now been shipped to Tokyo as a stand-by in case of need. A second Napier engine will be installed in the Vulture at Tokyo, and a third, a high-compression engine, will be installed at Toronto. Lt.-Col. L. E. Broome will be used in place of the undercarriage to ensure the safe passage of the machine through the Aleutian Islands.

The flight is scheduled to finish on June 28 next.

The Imperial Air Transport Company, Ltd

Although no appointments have yet been announced as to the controlling personnel of the I.A.T., The Aeroplane understands that it has now been decided definitely that the Managing Director is to be Colonel Frank Searle and that the General Manager is to be Major George E. Woods Humphery. Both these gentlemen held the same posts in the Daimler Airway.

British Flying Competitions in 1924.

A meeting of the Racing Committee of the Royal Aero Club was held on Mar. 17, 1924, at which the following decisions were made.

The Light Aeroplane Competition :—It was decided to hold the Competition at Lympne during the second week in September.

The Aerial Derby :—The Committee after considering reports on various sites for the Aerial Derby decided to hold this year's race at Lympne on August Bank Holiday. A course of about 40 miles will be selected and five circuits will be flown, making a total of approximately 200 miles.

The race for the Air League Challenge Cup to be competed for by Royal Air Force pilots will form part of the programme, and it is also hoped to arrange a race for Light Aeroplanes.

The British Empire Exhibition :—It was decided that every effort should be made to hold a Race Meeting during the Summer from Hendon in connection with the Empire Exhibition at Wembley.

[Lympne seems a suitable situation for the Light Aeroplane Competition, but there seems no particular reason for holding the Aerial Derby there except that the Lord Edward Grosvenor lives alongside the aerodrome and is very hospitable, added to which there is a good hotel and a golf course at Hythe. One would have imagined that this year of all years, when so many visitors are expected in London for the British Empire Exhibition at Wembley, a special effort would have been made to organise a big flying meeting at Croydon or Hendon, with the Aerial Derby as the chief attraction. Still, the ways of Royal Aero Club Committees have always been of the strangest There seems to be a great deal in having "a aunt wot lives at Yarmouth.—C. G. G.]

A Labour Minister's Opportunity.

During the past few months quite a number of the more important officials of the Air Ministry, ranging from Secretaries of State through the polysyllabic ranks of the Air Force to mere officials of the Department of Civil Aviation have expressed their profound interest in the light aeroplane and their hopes that eventually this type of machine would come into general use and serve to popularise flying and to imbue the younger members of the nation with the flying sense.

Within the past few days a pilot of very old standing hopefully consulted the constructors of a successful light aeroplane with a view to acquiring for himself a cheap flying apparatus whereon to take himself to the air. The firm in question were perfectly frank with him. They explained that it was quite true that a serviceable light aeroplane suitable for his purpose could be built for quite a reasonable sum. But they pointed out to him that he would only be allowed to fly that machine within a three-miles radius of an aerodrome unless that machine was built under A.I.D. inspection, was equipped with an airworthiness certificate, and duly registered. They also pointed out that he himself must be licensed to fly and must be provided with a tame and portable ground engineer.

They were quite willing to provide him with a machine inspected and certified as airworthy, but the price thereof would be at least twice the price at which the same aircraft could be sold if the A.I.D. and the Air Ministry could be persuaded to leave it alone.

Incidentally it is gathered that similar obstacles obstruct not only light aeroplanes, but also engines for such craft. It appears that the Air Ministry have taken cognisance of the existence of one of the motor-cycle engines within the 750 c.c. class which has performed most satisfactorily in a light aeroplane and have informed the makers thereof what should be done to it to secure official approval as an aero-engine. As a result an engine which costs precisely twice as much as the original type, which is much less simple to instal, and promises to develop rather less power for appreciably more weight, is likely to be inflicted on would-be owners of light aeroplanes who wish to fly cheaply.

Certain members of the present Government have publicly admitted that before the Labour Party's policy of Socialisation of Industry can become practicable it will be necessary to show that a Government Department which is concerned with industrial affairs can be so organised as to be free from the commonly known defects of bureaucracy. The attention of the Secretary of State for Air may therefore be drawn to the unrivalled opportunity afforded by the Air Ministry for a demonstration of what can be done in this respect.

More British Visitors to the States.

One learns that Mr. Rex Pierson, designer in chief to Vickers Ltd., has just returned from a visit to the United States. While in New York he had a conference with various members of Canadian commercial aviation companies and it was decided that the Vickers Co. should design a flying boat suitable for Canadian requirements, to be sent to Canada this summer for demonstration to the companies interested.

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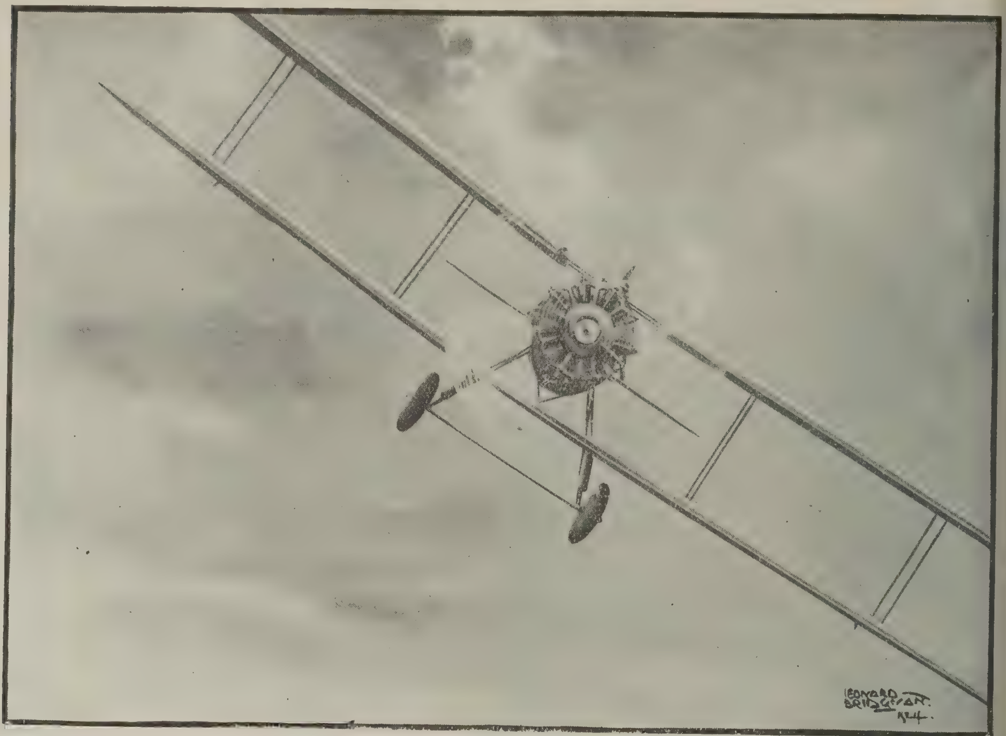
LEONARD BRIDGMAN.

CLEAN LINES.—A drawing by Mr. Leonard Bridgman of the all-metal Short Springbok (400 h.p. Bristol Jupiter). The clean appearance of this machine is shown in a striking manner in this picture.

Engine Department of William Beardmore and Co. Ltd., and Major S. R. McCrindle of the Bristol Aeroplane Co. have recently returned from the United States, where they have been on a visit of inspection.

Test Work in Sweden.

Mr. Frank Courtney has just returned from the North of Sweden where he has been engaged in testing some Armstrong-Whitworth machines. He states that the machines behaved excellently in the trying conditions which he encountered within the Arctic Circle where the Swedish Royal Air Force operates. The water-cooled engines have to be steam heated for some twenty minutes before they will start. For this purpose a type of field kitchen has been specially adapted. The air-cooled engines ran well when once they had started but it was found necessary to pour oil in at a very high temperature.

The Institution of Aeronautical Engineers.

The Annual General meeting of the Institution of Aeronautical Engineers, originally fixed for Mar. 20, was postponed until Mar. 24. Owing to notice of this change failing to reach THE AEROPLANE until the last issue had gone to press it was not possible to notify this alteration.

The report of the Chairman concerning the past year's work showed that the Institution had an increasing membership and that it remains in a sound financial position.

LT.-COL. J. T. MOORE-BRABAZON M.C., M.P., in his presidential address, said that the Institution was now in a stronger position than ever before. In the past twelve months there had been a marked movement in Aeronautics. One of the most striking features of the period was the great advance made by America in the design and construction of high-speed aircraft. The American success in the Schneider Cup however was not to be attributed to any lack of designing ability in this country, but rather to lack of funds for the production of such machines.

The British development of the light aeroplane was welcome as showing that one could once more look forward to the development of flying by private individuals.

The general public was now thoroughly disturbed as to our lack of air defences, and the Government was taking the first steps towards the provision of an adequate Air Force. That must react favourably on the Aircraft Industry to the benefit of the Institution and the members thereof.

Unfortunately the report stage of the Air Estimates called for his presence in the House of Commons that evening, and neither he nor Commander Burney could be present to hear Mr. Ashbolt put the case for the development of Imperial airship services. The airship alone at present could bring more closely together the constitutent parts of the Empire and such a service would appeal to the people of the Empire if the case for it were put before them properly. The project for this service had been dawdling about far too long.

Mr. Ashbolt's paper on Empire communications will be reported in the next issue.

Training and the Law.

Proceedings were taken at Coventry County Police Court on Mar. 21 against Hugh Arthur Francis, Whitley Aerodrome, an officer in the Royal Air Force, for being the person in an aircraft carrying out flying, which, by reason of low altitude, or proximity to persons, was the cause of unnecessary danger to persons and property, contrary to the Air Navigation (Consolidation) Order, 1923.

Evidence was given by a farm worker that he was working a pair of horses in a field when he saw an aeroplane approaching. The machine circled a number of times over the field with the engine shut off and flying very low. It came towards witness and when near the horses the pilot started up the engine again, causing the horses to jump about. Cross-examined by Mr. R. Hollick (for the defendant), witness admitted the machine did not frighten him; the danger was to the horses. Two other witnesses were called to corroborate. It was stated in defence that the defendant in question was chief instructor at the aerodrome. A very important part of the training course was dual control instruction in forced landings which was being carried out that day.

Defendant stated that on this occasion the machine never came lower than 100 feet, and to come down to 10 feet, as alleged, would have been a totally unnecessary risk. Charles Tiptaft Robinson, a R.A.F. officer, who was the pupil in the machine, supported defendant's statement.

The Chairman, in announcing the dismissal of the case, said it was one into which inquiry should have been made but the Bench was not satisfied there was danger to persons or property. They expressed the opinion that the greatest care should always be taken, in the course of this absolutely necessary training.

French Policy (Alleged).

M. Poincaré in a letter dated Feb. 25, in reply to a letter from Mr. Ramsay MacDonald, dated Feb. 21, and published in condensed form in *The Times* of March 3, insists that France has no desire to destroy Germany, nor has she intended at any time to annex German territory.

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Successes with MARS I and Gloster fitted with Napier Lion Engine, include :—

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HOLDERS OF BRITISH SPEED RECORD 212.2 M.P.H.

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She has not claimed that the Rhine should be a frontier, but only that it should no longer be possible for Germany to use the Rhine as a base for further attack. In the interests of peace, the Rhine should be a barrier against aggression.

He denies that French military and aerial establishments are directed against Great Britain. They are "exclusively designed" as protection against German revenge.

The attitude of France in international matters is not directed by selfish motives, but by the belief that "when France is indemnified for her ruins and sheltered from attack, the whole Continent will have greater likelihood of regaining tranquillity."

In regard to the loans made to the Little Entente, M. Poincaré says that pending the grant of effective peace guarantees, France has been anxious to maintain contact with all nations which have a loyal interest in the treaties which have produced the present European structure.

[One may add that very possibly France, after her experience of Russia as an ally in the War 1914-18 is deliberately arming the Little Entente (Czecho-Slovakia, Poland, and Yugo-Slavia) as a barrier against Russia from the Baltic to the Mediterranean.—Ed., The Aeroplane.]

The 1924 American Race Meeting.

The 1924 National Air Race Meeting during which will be held the 5th Annual Pulitzer Trophy Race will be held on Oct. 2-4 at Wilbur-Wright Field, Dayton, Ohio.

Included in the Race Meeting are the following events :—

(i) The "On-to-Dayton" Race for the Dayton Chapter N.A.A. Trophy and $3,500 in Liberty Bonds. This contest is open to civilian pilots flying any make or type of aircraft and points will be awarded for distance flown, average speed, number of passengers carried, and engine horse-power, the object of the race being to encourage civilian pilots to fly to the Dayton Race Meeting. This contest is open from Sept. 20-Oct. 1.

(ii) A race for two-seater low-powered aeroplanes for a Trophy not yet donated and $3,000 in Liberty Bonds, to be competed for by aeroplanes with engines of 510 cubic inches (8,313 c.c.) piston displacement or less (127.5 h.p.) over six laps of a 15-mile course.

(iii) A race for two- three- or four- seater aeroplanes for a Trophy not yet donated and $3,500 in Liberty Bonds, to be competed for by aeroplanes with engines of 800 cubic inches (13,000 c.c.) piston displacement or less (200 h.p.) over eight laps of a 15-mile course.

(iv) A Race for two-seater observation aeroplanes for the Liberty Engine-Builders' Trophy and $3,000 in Liberty Bonds. Over 12 laps of the 15-mile course.

(v) A Duration Race for Model Aeroplanes for the Mulvihill Model Trophy.

(vi) A Handicap Race for light commercial aeroplanes for the Aviation Country Club of Detroit Trophy and $4,000 in Liberty Bonds. Over eight laps of the course.

(vii) A Light Aeroplane Contest for the Dayton Daily News Trophy and $3,250 in Liberty Bonds, to be competed for by aeroplanes with engines of 80 cubic inches (1,300 c.c.) piston displacement (20 h.p.) or less over five laps of a five-mile closed course.

(viii) A Race for large-capacity aeroplanes for the Dayton Chamber of Commerce Trophy and $4,000 in Liberty Bonds for aeroplanes carrying 2,000 lbs. or over of paying load. Over ten laps of the 15-mile course.

(ix) A Race for Air Mail machines and pilots for the Dayton News Air Mail Trophy and $4,000 in Liberty Bonds. Over six laps of a 50-kilom. course.

(x) A Speed and Efficiency Race for light aeroplanes for two trophies not yet donated and $5,000 in Liberty Bonds. Over ten laps of a five-mile course.

(xi) A Race for pursuit-type aeroplanes for the Brig.-Gen. Wm. Mitchell Trophy for pilots of the 1st Pursuit Group, U.S.A.S. Over four laps of a 50-kilom. course.

(xii) A Race for the Pulitzer Trophy Race and $10,000 in Liberty Bonds. Over four laps of a 50-kilom. course. For this race all competing aircraft must have an air speed greater than 175 m.p.h. as loaded for the start of the race and a stalling speed not exceeding 75 m.p.h. in still air.

The Legion d'Honneur.

The decoration of Officer of the Legion has been conferred on M. Sadi Lecointe who obtained his pilot's certificate in 1910 and who has held on eight occasions the World's speed record and four times the height record besides holding seven other records. He has also done valuable work as an engineer specialising in what are termed in France chaser aeroplanes.

An interesting appointment is that of Mademoiselle Adrienne Bolland who has been created a Chevalier. She was the first woman to fly between Paris and London and she has also flown over the Andes using on each occasion a Caudron machine. Several pilots engaged on civil air lines also received decorations.

An Attempt on the 1,000 km. Record.

On Mar. 9 Adjt. Discours, of the Section Technique, made an attempt to beat the 1,000 km. record at present held by America. Over the circuit Villesauvage-La-Marmogne (5 kms.) he succeeded in covering 300 kms. at an average speed of 221.2 kms. (138.25 miles) per hour, or 16.2 kms. (10.125 miles) per hour faster than the previous record. Over Artenay a connecting-rod broke, and from 40-60 m. altitude he was forced to land in a ploughed field. The machine, a Spad 41 (300 h.p. Hispano-Suiza) landed on its nose and immediately caught fire. The pilot fortunately escaped injury, but the machine was completely destroyed.

A Danish Height Record.

In competition for a cup donated by the Danish Aero Club, two Danish Army officers, Lieuts. Erlind and Steinbeck both flying Fokker C.1 two-seater observation biplanes (185 h.p. B.M.W. engine) reached heights of 7,450 m. (24,436 ft.) and 7,400 m. (24,272 ft.) respectively.

Lieut. Erlind was awarded the cup and both officers succeeded in bettering the Danish height record, a very good performance for perfectly standard aircraft fitted with engines of medium horsepower.

The Fokker C.1 is a two-seater version of the famous D.VII and the design therefore can be considered as being something like six or seven years old.

The Latest Fokker Fighter.

Tests have just been completed with the Fokker D.C.1 which is a fighter and observation machine. It is a biplane fitted with a 450 h.p. Napier Lion engine and tests have been carried through by Mr. Grassé, who is the chief test pilot of the Fokker Works and was lately chief pilot to the Aeronautical Section of the Dutch Army.

Carrying a full load of 1,365 lbs. of useful weight the machine attained a top speed of 164 m.p.h. and a landing speed of 53 m.p.h. It climbed to 20,000 feet in 35 minutes and it took off in 30 yards and landed in 120 yards.

The machine can be fitted with wings of larger area and is then called the C.4 and is used as a heavy observation machine. Its speed is then 162.5 m.p.h. and its landing speed is 50 m.p.h. It requires 110 yards to take off, and 150 yards in which to land carrying a useful load of 2,100 lbs.

Aerial Survey in Ontario.

The Times own correspondent writing from Toronto on Feb. 26, states :—

> An aeroplane fleet consisting of 13 machines is to be purchased by the Ontario Government to survey the Province's forest wealth and to protect the lumber and paper industry, which represents an investment of 75,000,000 dols. [£15,000,000]. The Province expects to save 250,000 dols [£50,000] annually by the proposed aeroplane service, which will make a daily patrol of the timber tracts.

The Fairchild Aerial Surveys Co.

The Fairchild Aerial Surveys Co. (of Canada) Ltd. have a considerable amount of work in hand at Lac Claire in the St. Michel district of Quebec.

Lac Claire is a small cache belonging to the Laurentide Co. and is almost completely isolated from the rest of civilisation, apart from which the weather conditions in winter make it difficult for communication with Grand' Mère the base of the Laurentide Co.

A Grand' Mère journal has a correspondent living at Lac Claire whose duty is to send out news of what the exiles of St. Michel are doing, and this news takes anything up to three days to reach Grand' Mère, a distance of about 60 miles.

The Fairchild Co. offered to carry news and mail between these two places on their return to Grand' Mère, and a batch of mail was recently delivered in Grand' Mère by Capt. K. F. Saunders who made the journey through a snowstorm and with the temperature at 40 degrees below zero on a H.S.2L. flying boat in 45 mins.

The Fairchild Co. are continually adding to their staff and equipment in order to cope with their continually enlarging sphere of action. They have recently acquired the services of Mr. Gerard H. Matthes, a well-known American civil engineer who has done a great deal of mapping work by aeroplane.

In flying equipment they have made a contract with the Huff-Daland Co. of Ogdensburg, N.Y. for a Huff-Daland "Petrel" to be fitted with interchangeable wheels, floats or ski and a Curtiss C.6 engine.

In aerial photography they have just made a contract with the Canadian Pacific Railway Co. to map 475 square miles of territory and to do 65 miles of railway location, and their most recent contract is with the Wayagamack Pulp and Paper Co. for 2,500 square miles of timber surveys.

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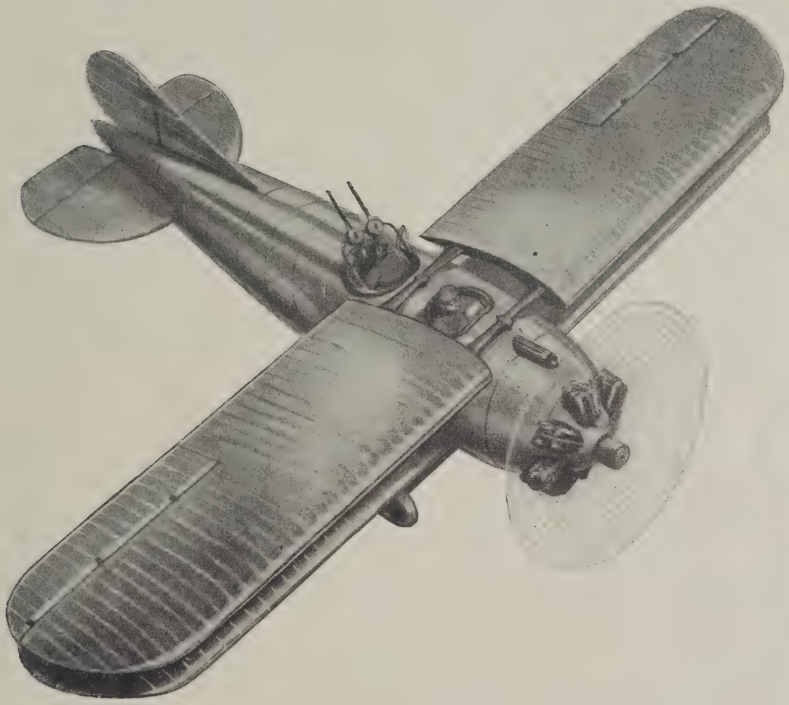

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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THE ROYAL AIR FORCE.

London Gazette.

Mar. 18.

In pursuance of His Majesty's pleasure the Rev. H. D. L. Viener, C.B.E., M.A., Chaplain-in-Chief, R.A.F., has been appointed an Hon. Chaplain to the King (Mar. 7).

GENERAL DUTIES BRANCH.—The follg. Flt. Lts. are granted permanent commns. in the rank stated (Mar. 19):—H. J. Collins, P H. Cummings, D.F.C., A. S. G. Lee, M.C., E. M. Pollard.

Lt. T. H. J. Wright, Seaforth Highlrs., is granted a temp. commn. as a Flg. Off. on seconding for four years' duty with the R.A.F (Mar. 15).

The follg. Pilot Officers on probation are confirmed in rank:—J. E. Doran-Webb (Feb. 14); A. R. Buchanan (Feb. 19).

RESERVE OF AIR FORCE OFFICERS.—The follg. are confirmed in rank:—with effect from the dates indicated:—FLG. OFFS. L. Reynolds (Feb. 21); R. C. Berlyn (Feb. 23): J. S Snedden (Feb. 27); D. B. C. Fulton (Feb. 29); J. A. Craig, D.F.C. (Mar. 5); L. Rawlinson (Mar. 5); N. S. McConnell (Mar. 18). PLT. OFF. F. J. Letzer (Feb. 27).

Appointments.

Week ending Mar. 24.

GENERAL DUTIES BRANCH.—Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., to H.Q., Iraq Command, pending taking over command, 13/3.

Wing Commanders W. C. Hicks, A.F.C., to Aircraft Depot, India, to command, 16/12; E. H. Johnston, O.B.E., to H.Q., India, for Air Staff duties, 23/2; A. H. Jackson, to Air Ministry for Personnel Staff duties, 23/4; A. T. Whitelock, to No. 3 Group H.Q., Spittlegate, for Air Staff duties, 15/4.

Squadron Leaders P. C. Maltby, D.S.O., A.F.C., to No. 1 School of T.T. (Boys), Halton, 15/4. G. R. M. Reid, D.S.O., M.C., to No. 99 Sqdn., Netheravon, 23/4, G. G. Adeley, to H.Q., Inland Area, Uxbridge, 15/4; J. C. Quinnell, D.F.C., to No. 9 Sqdn., Upavon, 23/4; R. M. Hill, M.C., A.F.C., to H.Q., Inland Area, 23/4; Sir N. R. A. D. Leslie, Bt., C.B.E., to Special Duty List as Asst. Secretary (Air) to the Committee of Imperial Defence, 23/4; G. W. Murlis-Green, D.S.O., M.C., to No. 41 Sqdn., Northolt, 15/4; R M. Bayley, D.F.C., to Air Ministry, 1/5; C H Elliott-Smith, A.F.C., to No. 24 Sqdn., Kenley, 23/4; J. C. Russell, D.S.O., to No. 3 Sqdn., Worthy Down, 23/4; H. P. Lale, D.S.O, D.F.C., to No. 23 Sqdn., Kenley, 15/4; T. F. Bullen, O.B.E., to No. 4 F.T.S., Egypt, 1/2; J. Leacroft, M.C., to R.A.F. Depot on transfer to Home Estab., 17/2; J. C. P. Wood, to Aircraft Depot, Iraq, 25/2; E. R. Manning, M.C., to Aircraft Depot, Egypt, 20/1; E. A. Beulah, to Aircraft Depot, India, 10/3; J. M. Robb, D.F.C., to No. 30 Sqdn., Iraq, 19/1.

Flight Lieutenants E. H. Richardson, to Aircraft Depot, India, 21/2; D. F. Stevenson, D.S.O., M.C., to H.Q., Inland Area, Uxbridge, 23/4; M. Thomas, D.F.C., A.F.C., to Air Ministry, 1/5; J. A. Glen, D.S.C., to Air Ministry, 23/4; A. G. Bishop, A.F.C., to No. 24 Sqdn., Kenley, 23/4; L. H. Cockey, to No. 3 Sqdn., Worthy Down, 23/4; F. M. F. West, V.C., M.C., to No. 17 Sqdn., Hawkinge, 23/4; K. L. Harris, to Air Ministry, 1/5; D. Gilley, D.F.C., to H.Q., Inland Area, Uxbridge, 7/4; T. J. West, M.C., to No. 19 Sqdn, Duxford, 1/4; A. L. Fiddament, D.F.C., to No. 2 Sqdn., Andover, 1/4; F. O. Soden, D.F.C., to No. 41, Sqdn., Northolt, 1/4; E. H. Hooper, to No. 5 F.T.S., Shotwick, for course of instruction, 15/3; W. C. Day, M.C., to No. 4 F.T.S., Egypt, 4/2.

Flying Officers D. d'H Humphreys, to Night Flying Flight, Biggin Hill, 29/3; A. Lanman, A.F.C., to School of T.T. (Men), Manston, 15/4; E. R. S. Hobson, D.F.C., to No. 56 Sqdn., Biggin Hill, 29/3; H. J. Wykes, to No. 12 Sqdn., Andover, 24/3; W. N. L. Cope, to R.A.F. Base, Leuchars, 1/4; R. L. Bateman, to R.A.F. Depot, on appointment to a S.S. commn., 18/3; R. F. Carter, A. L. R. Duke, W. F. Humphrey, M. E B. P. Storrie and G. N. P. Stringer, to No. 5 F.T.S., Shotwick, on appointment to S.S. commns. for course of instruction, 15/3; T. H J. Wright, to No. 5 F.T.S., Shotwick, on appointment to a Temp. Commn. from Army for course of instruction, 15/3; J. A. Stedman, to School of T.T. (Men), Manston, 10/4; H. W. Taylor, to No. 17 Sqdn., Hawkinge, 1/4; J. D. S. Denholm, to No. 4 Arm. Car Coy., Iraq, 1/3; J. C. Walker, to No. 5 Arm. Car Coy., Iraq, 26/2; C. E. Stuart, to No. 14 Sqdn, Palestine, 23/12; H. V. David, to No. 84 Sqdn., Iraq, 4/3; R. Duncanson, to No. 84 Sqdn., Iraq, 29/2; J. C. Bedford, to R A.F. Depot (Non-effective Pool), on transfer to Home Estab., 22/2; C. W. McK. Thompson, to Aeroplane Exper. Estab., Martlesham Heath, 1/4; R. G. Chapell, to School of T.T. (Men), Manston, 27/3.

Pilot Officers.—The undermentioned Pilot Officers are posted to No. 5 F.T.S., Shotwick, on appointment to S.S. commns. (on probation) for course of instruction, 15/3: B. O. Babb, H. E. N. Burton, J. M. Cohn, F. H. S. David, G. Feather, E. A. H. Fisher, R. A. Ford, A. N. Francombe, V. G. H. Gee, M. W. Goldie, V. Bigham-Hall, M.C., C. E. Hillier, L. M. Johnston, W. J. Lewis, H. R. Lowry, H. F. Luxmoore, A. L. Macmillan, A. W. B. McDonald, A. D. McDowell, A. W. G. Martin, H. S Martin, W. V. R. Nicholl, H. M. Parker, D. K. Power, G. B. M. Rhind, C. D. Shearing, E. L. Shepherd, C. S. Staniland, H. W. P. Stewart, N. A. West; A. H. Grace, to No. 3 Sqdn., Worthy Down, 1/4; H. J. Storey, to Aircraft Depot, India, 15/3.

MEDICAL BRANCH.—Flying Officer (Medical) (Hon. Flt. Lt.) G. R. Hall, M.D., to R.A.F. Depot, 1/4.

STORE AND ACCOUNTANT BRANCH.—Squadron Leader (Stores) H. T. Foxen, to H.Q., Iraq Command, 14/3. Flying Officer (Stores) C. T Davis, to No. 4 F.T.S., Egypt, 20/1.

Mar. 21.

MEDICAL BRANCH.—The follg. are dismissed the service by sentence of General Field Court Martial (Dec. 9, 1923): Sqdn. Ldr. J. H. Porter, M.C., M.B.; Flt. Lt. P. J. Flood.

The King's Levee.

His Majesty the King held a Levée at St. James's Palace on Mar. 18. H.R.H. Group Captain the Duke of York was present.

Among those in attendance upon His Majesty was Air Chief Marshal Sir Hugh Trenchard, Principal Air Aide-de-Camp.

Lord Thomson, the Secretary of State for Air, Air Commodores T. I. Webb-Bowen and J. M. Steel and Flt. Lt. W. F. Dickson were among those who attended the Levée.

The following officers of the Royal Air Force were presented to His Majesty on appointment by the Secretary of State for Air:—

The Rev. C. Allen, M.A., Chaplain, R.A.F., Sq. Ldr. C. Archbold, Flt. Lt. D. Barron, Flg. Off. C. Dagg, A.F.C., Wing Cdr. J. Fletcher, A.F.C., Flt. Lt. Gifford, Flt. Lt. R. Goddard, Sq. Ldr. J. Graham, M.C., A.F.C., Flg. Off. P. Harris, Sq. Ldr. E. Harrison, Sq. Ldr. T. Howe, A.F.C., Flg. Off O. Jones Lloyd, Flt. Lt. R. Meek, Group Captain C. Newall, C.M.G., C.B.E., A.M., A.D.C., Flt. Lt. C. Stilwell.

An Aerial Entente.

The visit of a party of officers of the R.A.F. Staff College to French Military Establishments as announced by the Under-Secretary of State for Air in the House of Commons recently will start on April 6. The party will include Air Vice-Marshal Brooke-Popham, Air Commodore Halahan and Group Capt. Newall, and will number some twelve in all.

It is understood that they will fly to Paris on twelve D.H.9as of No. 39 Squadron, the formation which did so well at the R.A.F. Pageant.

The R.A.F. in Malta.

The following is extracted from the Daily Malta Chronicle of Feb. 22:—

At the invitation of Group Capt. A. Wellesley Bigsworth, C.M.G., D.S.O., A.F.C., Commanding the R.A.F., Mediterranean, a large gathering attended at the Hal Far Aerodrome on Tuesday afternoon to witness the first flight of service aircraft from the aerodrome. Those present included His Excellency Field Marshal Lord Plumer and Lady Plumer, The Lieutenant Governor and Mrs. Robertson, the Prime Minister, the Chief Justice and Mrs. Mercieca, Sir Gerald and Miss Strickland, and the Members of the Legislative Assembly.

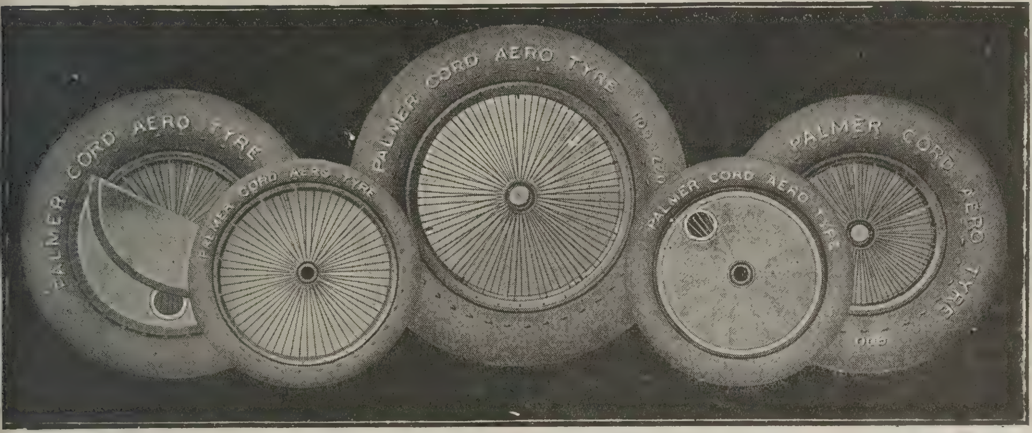
The proceedings opened with an inspection of a Fairey Flycatcher with a Jaguar engine, fitted to fly off or onto either an aerodrome or a ship's deck. After the points of the machine had been explained by Sq. Ldr. L. H. Slatter, O.B.E., D.F.C., D.S.C. (Commanding, R.A.F. Base, Calafrana) and his officers, Flg. Off. E. F. Waring proceeded to carry out a most entertaining exhibition of aerobatics.

Five seaplanes in formation then appeared from the direction of Calafrana. Three of them climbed to 5,000 feet to enact the part of the enemy about to bomb the aerodrome. The pilot of the Flycatcher flew to attack them, and the evolutions of an aerial battle were then demonstrated to the interested onlookers. The enemy proved too strong for the defensive machine which descended out of control in a dizzy spin. The enemy aircraft then concluded the proceedings by bombing the aerodrome, getting a direct hit on the specially erected building which went up in flames.

BOMBING THE HAL FAR AERODROME.—The target may be seen in the middle of the smoke caused by the bursting bombs.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
„	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
„	138	130.	38.09	Central
575×60	21	160.	28.	Central
„	34	150.	31.75	104/46
„	111	150.	38.09	104/46
600×75	21	160.	28.	Central
„	34	150.	31.75	104/46
„	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
„	79	178.	44.45	Central
„	100	178.	38.09	132/46
„	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
„	92	185.	55.	135/50
„	95	185.	55.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	96	178.	55.	132/46
„	99	178.	38.89	132/46
„	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
„	92	185.	55.	135/50
„	95	185.	55.	Central
„	96	178.	55.	132/46
„	99	178.	38.89	132/46
„	112	150.	38.09	Central
800×150	82	185.	55.	135/50
„	85	185.	55.	Central
„	36*	185.	55.	135/50
„	40*	185.	60.32	135/50
„	152	185.	66.67	135/50
„	163*	185.	66.67	135/50
1000×150	131	220.	66.67	Central
„	102	185.	55.	125/60
„	141	250.	80.	Central
„	201	185.	60.32	125/60

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	209	185.	55.	Central
„	210	185.	60.32	Central
1000×180	148	220.	80.	Central
„	149	185.	55.	Central
„	155	220.	66.67	Central
900×200	107	185.	55.	Central
„	108	185.	55.	125/60
„	128	220.	66.67	Central
„	137	250.	80.	Central
„	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
„	136	250.	80.	Central
1250×250	133	250.	80.	Central
„	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
„	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

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N/NK.

Good Work.

A seaplane belonging to the R.A.F. Unit at Calshot and piloted by Sq. Ldr. W. B. Callaway, A.F.C., left Calshot on Mar. 21 for the works of Short Bros. at Rochester for reconditioning. Running into a thick fog Sq. Ldr. Callaway flew out to sea and eventually moored the machine to a tramp steamer, the crew spending the night on board the tramp. The flight was completed on the following day.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Rugby Football.

The following cablegram was received by the Secretary R.A.F. Sports Board, from the R.A.F. Cairo: "Royal Air Force beat Army by 15 points to 14. Dated Mar. 20."

The R.A.F. Cup.

(Unofficial.)

Netheravon v. Duxford.—Duxford, who were the runners-up last year met Netheravon, the holders, at Uxbridge on Mar. 20 in the final for the R.A.F. Rugby Cup. A small but enthusiatic crowd turned out to see the game which resulted in a win for Netheravon by a placed goal, a penalty goal, and a try (11), to a try (3).

The game was fast and keen but very unscientific. After about 30 minutes' loose and scrappy play Plt. Off. Forster who gathered smartly from a cross-kick and touched down between the posts scored for Duxford. The place kick fell short.

Netheravon got together better in the second half and a series of forward rushes led to Sjt. Ridge scoring from a scrimmage near the flag. The goal kick from a difficult angle failed. From this point the play grew worse.

From a penalty kick Flt. Lt. T. L. Lowe scored a goal. Duxford then made a desperate effort to recover themselves and some careless passing by the Netheravon three-quarters let them nearly through. The movement was defeated by Netheravon's full back, Flt. Lt. Fenwick, who was playing a cool steady game. He dropped the ball but went straight down on it—cold hands perhaps but certainly not cold feet.

Flg. Off. Wackett scored the final try for Netheravon, Flt. Lt. Lowe placing a goal.

Neither team played good Rugby. The passing was shocking, too low and always wild and erratic. The passes were nearly always taken—or dropped—standing. With the exception of Flt. Lt. Lowe and both full-backs, the kicking was equally bad touch-finding being quite exceptional. The Duxford fly-half Plt. Off. Marcy has a useful pair of hands. The rest of both teams might just as well have been playing in flying gloves.

Netheravon won the game with their scrimmaging. They packed down properly and heeled out quickly, and at the base of the scrum they had Flg. Off. Rose getting the ball. The Duxford forwards were useful in the loose but had no idea of packing down. The game itself made up in keenness and hard going what it lacked in skill. The teams were:—

Netheravon:—Flt. Lt. Fenwick; Sjt. Ridge, Plt. Off. Hale-Munro, Cpl. Clayton, L-AC. Gordon, Flg. Off. Hogben, Flg. Off. Rose; Flt. Lt. T. Lowe, Flg. Off. Adams, Flg. Off Wackett, Sjt. Sheppard, Flt. Lt. James, Flg. Off. Hall, Plt Off. Boston, and Plt. Off. Wintour.

Duxford:—Plt. Off. Moon; Plt. Off. Colquhoun, Plt Off. Forster, Sjt. Snaith, Flt. Lt. Sanderson; Flg. Off. Bates, Plt. Off. Marcy; Flg. Off. Flinn, Flg. Off. Harcourt Vernon, Plt. Offs. Chichester, Mason, Finn, Pellew, L-AC. Collins and AC. Rose.

Association Football.

R.A.F. v. R.N.:—The Royal Navy beat the R.A.F. in the first match of the Inter-Services Football Championship at Fratton Park on Mar. 19 by one goal to nil.

The R.A.F. team were.—Hadley (Spittlegate); Williams (Cranwell), Fretwell (Spittlegate); Dickson (Cranwell), Young (Spittlegate), Spooner (Uxbridge); Frances (Cranwell), Weaver (Halton), Anderson (Uxbridge), Dempsey (Isle of Grain), Martin (Duxford).

R.A.F. Sports at Peshawar.

No. 5 Sqdn., Ambala, in the year 1923-24 have won the Football Cup, the Hockey Cup, the Athletic Challenge Cup and the Patiala Challenge Cup for the highest aggregate for the meeting at Peshawar. The Boxing Cup was won by No 20 Squadron, Quetta. and the Aircraft Depot, Karachi, produced the champion athlete in AC. Eastdown.

BOXING.—Finals:—*Fly-weights*: Millington (28 Sqdn). *Bantam-weight*: AC. Pipe (31 Sqdn.). *Feather-weight*: AC. Hughes (Aircraft Park). *Light-weight*: AC. Barren (20 Sqdn.). *Welter-weight*: AC. Waite (5 Sqdn.). *Middle-weight*: AC. Bourne (60 Sqdn.). *Light-Heavy-weight*: AC. Lodder (5 Sqdn.). *Heavy-weight*: L-AC. Eldridge (20 Sqdn.).

ASSOCIATION FOOTBALL.—No. 5 Sqdn. (3) beat Aircraft Depot (2). Aircraft Park (8) beat No. 20 Sqdn. (1). No. 27 Sqdn. (1) beat No. 31 Sqdn. (0). No. 60 Sqdn. (3) beat No. 28 Sqdn. (1).

No 5 Sqdn. (4) beat Aircraft Park (1). No. 27 Sqdn. (2) beat No. 60 Sqdn. (0).

Final: No. 5 Sqdn. (3) beat No. 27 Sqdn. (2).

HOCKEY.—Aircraft Park (4) beat No. 60 Sqdn. (2). No. 20 Sqdn. (1) beat No. 28 Sqdn. (0). No. 27 Sqdn. (2) beat Aircraft Depot (1). No. 5 Sqdn. (3) beat No. 31 Sqdn. (1).

No. 20 Sqdn. (2) beat Aircraft Park (0). No. 5 Sqdn. (4) beat No. 27 Sqdn. (1).

ATHLETICS.—100 Yards:—1, Eastdown (Aircraft Depot). 2, Owen (5 Sqdn). 3, Hall (20 Sqdn.).

880 Yards:—1, Scrivener (5 Sqdn.). 2, Williams (5 Sqdn.). 3, Scotland (Depot).

High Jump:—1, Ibbotsen (5 Sqdn.). 2, Chown (28 Sqdn). 3, Flg. Off. Smith (69 Sqdn.).

120 Yards Hurdles:—1, Flt. Sjt. Forbes (31 Sqdn.). 2, Sjt. Bloy (Depot). 3, Chown (28 Sqdn.).

1 Mile:—1, Fern (27 Sqdn.). 2, Elton (5 Sqdn.). 3, Hughes (Park).

220 Yards:—1, Eastdown (Depot) 2, Owen (5 Sqdn.). 3, Hart (5 Sqdn).

Long Jump:—Flt. Sjt. Forbes (31 Sqdn.). 2, Flg. Off. Norton (31 Sqdn.). 3, L-AC. Jones (5 Sqdn.).

440 Yards:—1, Eastbourne (Depot). 2, Williams (5 Sqdn.). 3, Harriet (5 Sqdn.).

Tug-of-War:—Finals: 31 Sqdn.

Relay Race:—No. 5 Sqdn., No. 31 Sqdn., No. 28 Sqdn.

3 Miles:—1, Wright (5 Sqdn.) 2, Fern (27 Sqdn.). 3, Walmsley (31 Sqdn.).

Hockey.

R.A.F. v. R.N. and R.M.—The Navy and Marines beat the R.A.F. at Halton on Feb. 27 by 4 goals to 2.

The ground was rather bumpy, and was the cause of a number of casualties. Both teams played very well and the fortunes of the games fluctuated remarkably. During the first half the Navy and Marines beat the Air Force goalkeeper twice, and the R.A.F. failed to reply. Major Brooks hit the first goal soon after the start, and Nicholson hit the second after about 20 minutes' play. This lead of two goals to none was, however, soon wiped off after change of ends, for Reeves, at inside left, and Gairdner, at centre-forward, each scored a goal within three minutes of the bully-off. The Navy's third goal was the result of a scramble, during which Nicholson was successful in giving his side the lead, and a few minutes from the end Clarke, at inside left, added the fourth goal after a splendid save by Gilley in the Air Force goal.

The R.A.F. team were:—

Flt. Lt. D. Gilley (Andover), goal; Flt. Lt. J. S. Smith (Halton) and Plt. Off. C. F. Roupell (Bircham Newton), backs; Sq. Ldr. L. C. Keeble (Isle of Grain), Flg. Off. H. Scott-Davidson (Gosport), and Flg. Off G. R. B. Smythe (Lee-on-Solent), half-backs; Flg Off. H. G. Sawyer (Isle of Grain), Flg. Off. C. H. Bird (Uxbridge), Flg. Off. W. D. Gairdner (Gosport), Plt. Off. F. G. Reeves (Gosport), and Flt. Lt. C. G. Wigglesworth (Calshot), forwards.

A TRIBUTE TO BRITISH AIRCRAFT.—The accompanying photograph shows the Argentine officers who intend to attempt to fly round the World. On the left of the picture is Signor Patrick Murphy, a well-known Argentine journalist who is acting as interpreter. Next to him is Major Stewart of the Aircraft Disposal Company. Next to him is Lieut. Nelson Page of the Argentine Navy, who is a grand-nephew of Mr. Nelson Page who was the American Ambassador to Italy. Next to him in the centre of the picture is Major Pedro Zanni of the Argentine Army who is the pilot and head of the expedition. Major Zanni it may be noted was the first Argentine pilot to fly across the Andes from Argentina to Chile. Next is Signor Felipe Beltrame, the engineer of the expedition. Next is Major Grant of the A.D.C. and Mr. Perry, Chief Pilot.

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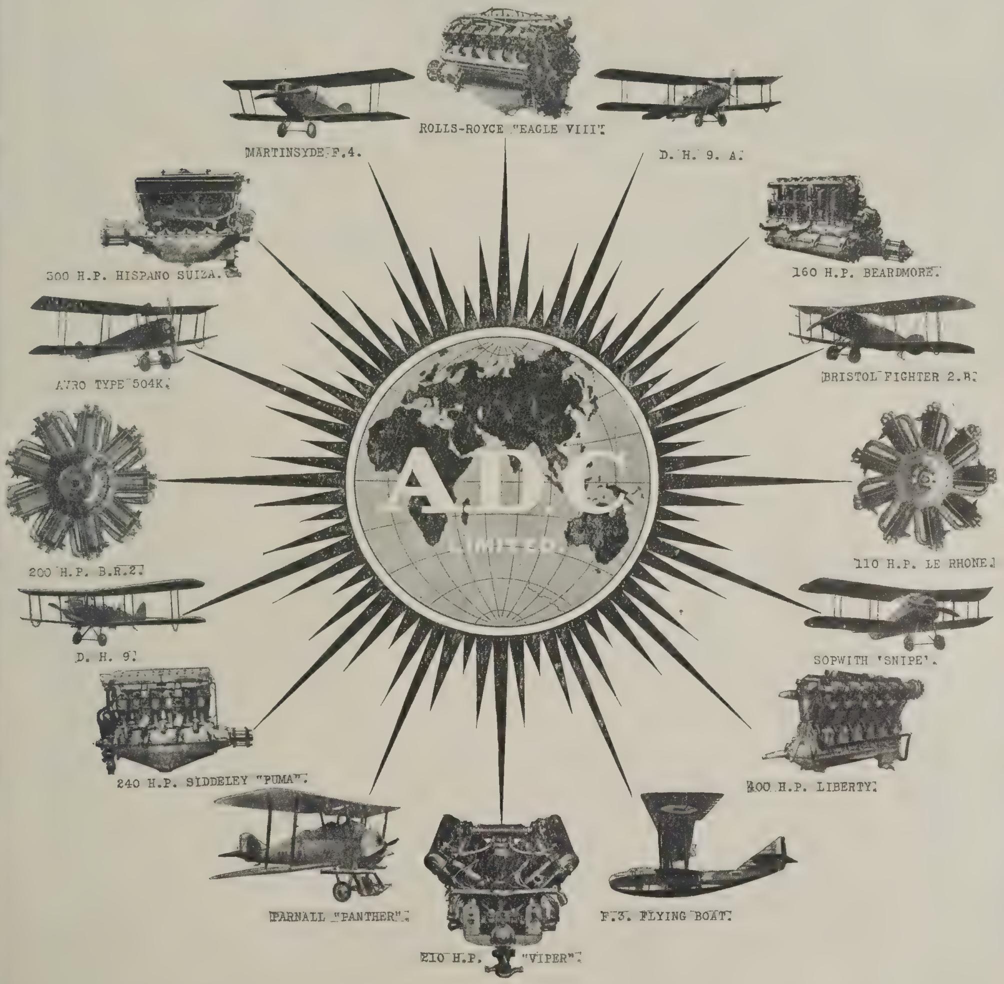

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MODEL TESTS AND FULL-SIZE RESULTS.

A paper by Capt. W. S. Farren, on recent work on the problems of the so-called Scale Effect carried out under the auspices of the Aeronautical Research Committee was read before the Royal Aeronautical Society on Mar. 20.

As is probably known a very considerable amount of very careful full-scale test work has recently been carried out at the R.A.E. at the instance of the Design Panel of the Aerodynamics Sub-Committee in order to provide as accurate a full-size check on wind tunnel tests as is possible. This work is the subject of a report which is yet to be passed for publication by the Committee. Capt. Farren's paper does not quote from the report itself but is based on the same experiments as that report.

The lecturer very accurately describes the aircraft designer as desiring to know how far he may trust model results as a guide to the performance of real aeroplanes. It cannot be said that the answer as given in this paper marks a very great advance.

Progress undoubtedly has been made, mainly in the matter of the accuracy and reliability of test results.

The Prandtl theory has given a correction for the influence on model figures of the effect of tunnel wall interference, and development of the technique of full-scale testing has led to improvement in the reliability of the deductions which can be drawn as to the aerodynamic qualities of full-size aeroplanes.

Comparison between model tests and full-size tests in the case of a Bristol fighter with wings of three different aspect ratios show that the change in full-scale performance due to the change in aspect ratio agrees very well indeed with the change that would have been predicted from model tests.

Further tests on an S.E.5 with two different shapes of body and two different wing arrangements gave less satisfactory results. The standard S.E.5 agrees in full size with model results. When the same wings are used with a different body an improvement in performance which would be expected from the model tests is not realised. When the modified wings are used with the modified body, the result is such as to suggest that the discrepancy between model and full-size arises elsewhere than in the wings.

Full-size tests to determine the centre of pressure by measuring the tail moment in flight show quite a large discrepancy between model and full-scale, despite the fact that full-scale pressure plottings agree relatively well with the models.

And finally, the well-known R.A.F. 19 full-scale tests, together with certain large-scale tests made at Göttingen, show that in some heavily curved surfaces high lift coefficients attained on the models cannot be reached on the real aeroplane.

From these and other results Capt. Farren comes to conclusions which are perhaps a little more definite than the now well-known one as to the reliability of model tests if confined to a normal R.A.F.15 biplane. These more definite conclusions may be summarised as follows :—

For wings of the general type of R.A.F.15, the full-size lift coefficient will agree with that of the model, and the full-size drag will differ by about 10% of the minimum drag of the whole aeroplane without airscrew. This difference in drag is fairly uniform over the whole flying range and it is suggested therefore that it is due to some part—probably the body—whose resistance does not change much with the lift coefficient.

When two normal aeroplanes differ only in wing arrangement, a model test is likely to predict the relative resistances accurately.

When the differences are in the body model tests may be misleading.

The opinion is expressed that model tests give the centre of pressure on wings accurately and that model figures should be used as a guide for wing stressing. Full-scale results are likely to be more reliable as a guide to tail-setting, however. (Capt. Farren here really implies that the apparent discrepancy as to C.P. position is due to forces and moments on the body—so that he is in effect blaming the body for practically all scale effects in " normal " aeroplanes.)

Finally Capt. Farren is not prepared to rely upon model experiments on " high-lift " wings, nor is he prepared to define what constitutes a " high-lift " wing.

However he states that both model and full-scale work on high-lift wings have been begun, so that in course of time some information on less normal types of aircraft than those from which these deductions are drawn will be available.

THE DISCUSSION.

In the discussion, Col. Ogilvie asked whether R.A.F.19 had ever been tested full scale as a monoplane and suggested that possibly biplane effects had had more to do with the apparent failure of this wing than scale effects.

MAJOR LOW said that the paper indicated that the Prandtl theory was now applied by the British authorities to the correction of model tests. How long had this been so and why had the suggestions of Mr. Lanchester been neglected until they returned to us from Germany? Personally he thought that complete use of Prandtl's corrections practically removed evidence of apparent scale effect.

MAJOR F. M. GREEN said that what the designer wanted were facts, which up to the present he did not get. He spoke scornfully of the Technical Press which he asserted told them of wonderful wing sections, but there was no authoritative information on which the designer could estimate how nearly the promised results would be realised in practice. The designer could not afford to risk his firm's money on machines of novel type until he knew more of what was to be expected in the full scale. They were still waiting to know what full size results could be expected from thick wings, Handley Page slots etc. It was desirable that test results of this kind should be published more rapidly than heretofore, but until they were available Major Green obviously did not consider that he was justified in making any experiments himself, for in his view the designer can only improve his aeroplanes in the light of knowledge.

CAPT. FARREN in his reply said that as to the Prandtl theory the Aerodynamics Research Committee did not adopt theories. If they worked they used them. Prandtl's theory was useful but did not reconcile model and full scale results. As to the neglect of Mr. Lanchester's suggestions in this country, the only explanation he could offer was that Mr. Lanchester always thought of things before anyone else and they could not keep up with anyone so far ahead of the times.

AND SOME COMMENTS.

The paper may be regarded as giving a fair amount of confirmation to the suggestion which has more than once been made in this paper, namely that interference between body, struts and other details and the wings accounted for more of the discrepancies between model and full-scale figures than did any direct scale effect—and that the relatively good agreement between model and full-scale figures for the normal thin-winged biplane was due mainly to the fact that in this type there was invariably a very great deal of interference—that it was in fact so bad aerodynamically that whatever was done to it in detail failed to alter its qualities appreciably.

It will probably be found eventually that a very considerable number of cases of apparently anomalous " scale-effect " phenomena are due to changes in the interference of details such as struts.

It is known that model figures for the resistance of such details are subject to very important scale corrections and it is usually assumed that a correction for their resistance as isolated bodies can be applied to them when they form part of a complete aeroplane. But it is pretty certain that the " scale-effect " on their resistance is accompanied by a " scale-effect " in the interference which they cause in the flow round other bodies in their vicinity. Any such effect is neglected in the current methods of using model results—but it may be of even greater importance than the correction which is ordinarily applied.

Major Green's attitude on the whole subject is perhaps exaggerated but is not unrepresentative of the attitude of the British Aircraft Industry as a whole. The individual designer is of course limited by the attitude of his employers as to the making of experiments, but after all it rests largely with him to convince the employer as to whether a given experiment is a reasonably safe one.

On the subject of the knowledge available to guide him in experimental work Mr. Green's view seems unreasonable. Mr. Farren's paper shows that the designer of twelve years ago accepted model results with a good deal more faith than was justifiable and by use of his own intelligence produced reasonably good aeroplanes. It also shows that if the designer waits for another ten years or so research—as at present carried on in this country—may be able to tell him just about as much concerning the anomalous behaviour of a full-scale high-lift wing—when compared to the model tests of the same section—as it now can concerning R.A.F.15. And that—in effect— is precious little.

R.A.F.19 seems to have frightened the average British designer out of his wits, and certain Göttingen tests at high speeds are generally accepted as giving a wide general confirmation as to the unreliability of heavily cambered sections generally. A careful examination of the figures show that they do nothing of the sort.

High-lift wings which develop a higher lift full-scale than in the model pretty certainly exist. The Göttingen tests on various sections over a wide range of speed and scale indicate that wings with a bluff rounded entry followed by marked concavity of the under-surface tend to lose their high-lift qualities at full scale. R.A.F.19 is an exaggerated example of this type of wing. Wings with sharp entering edges—even heavily cambered on the under surface—appear to suffer considerably less in this respect, and a reduction

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in the concavity at the trailing edge appears also to remove this particular failing.

Also, despite Mr. Farren's incredulity, there is very strong ground for holding that a high-lift wing cannot safely be used as a biplane unless the greatest possible precautions are taken against interference, both of wing on wing and the interplane bracing on wings.

The position in fact is that there are available a very large number of model tests—some made at Göttingen others in the U.S.A.—on high-lift wings. The accuracy of the Göttingen tests at least can scarcely be questioned seriously, and although they are not directly comparable with N.P.L. tests, the application of corrections for aspect ratio and tunnel interference effects can easily be made. The Göttingen tests also supply a guide as to what types of wing may reasonably be suspected of developing large "scale effects."

Even if it is assumed that all high-lift wings are prone to vicious habits in regard to maximum lift at the full scale, there is no reason to suppose that any that one would be likely to use are likely to be worse than R.A.F.19, in this respect, and the evidence from all hands so far indicates that except in regard to the development of maximum lift the full scale wing is slightly better than the model.

Allowing for this possible fall in maximum lift, the designer can select from among the results now available wing sections which have aerodynamical characteristics practically equal to those of R.A.F.15 with the exception that at the worst they have a maximum lift coefficient 20 per cent. greater than that wing, and at the best may have one nearly 60 per cent better. Taking the worst view of the case and designing to meet it, the risks to be encountered in building an experimental machine for such a wing are not large—certainly compared to the risks which have been taken by aeroplane designers in the past.

And it is perfectly certain that if all designers wait for the Aeronautical Research Committee to settle the scale-effect problem before designing anything but R.A.F.15 biplanes the improvement of the aeroplane is going to be a very slow process.—W. H. S.

Aeronautics in Glasgow.

During a recent visit to Glasgow, following an absence from that city of some twenty years, it was difficult at the first to discover that any change whatever had taken place. The tramcars were there—as noisy as ever—'buses were not to be seen. The Clyde at the Broomielaw was of the same doubtful cocoa colour and consistency. There seemed perhaps to be even a few more people in the streets, but they seemed to be still the same people. However closer investigation showed that Glasgow had not altogether stood still.

For it appears that the Scottish Branch of the Royal Aeronautical Society—thanks to the energy of Mr. J. Buyers Black the Secretary, who is enthusiastically backed by Lord Weir of Eastwood, Lord Invernairn, and Col. J. G. Weir—is carrying on an extremely useful campaign among the engineering students who are to be found in large numbers both at Glasgow University and at the Royal Technical College. The work of the Society has been so successful that Mr. Black has in his possession the names of over 150 engineering students who have signified their wish to specialise in aeronautical engineering whenever they can be assured that that particular profession can offer them any reasonable prospects of a career.

It is understood that the attention of the Air Ministry has frequently been drawn to this particular fact, and that the Ministry has equally frequently expressed its gratification and has promised that in the near future arrangements shall be made whereby these potential aeronautical engineers shall be given the opportunity of serving in that engineering service which the R.A.F. so badly needs but does not yet possess. But those promises remain promises and so far nothing has been done in the matter and quite a number of promising young engineers who would have willingly taken up aeronautical work have been forced to seek work in other and generally overcrowded branches of industry.

A more encouraging state of affairs for the would-be student of aeronautical engineering in Scotland is the re-opening of the aircraft department of the great firm of William Beardmore Ltd. As is already known to the readers of this paper, Beardmores have recently acquired the services of Mr. W. S. Shackleton, and work is already in hand at Dalmuir on the construction of a two-seater light aeroplane for the forthcoming Air Ministry Competitions.

This machine—as might be expected from Mr. Shackleton's previous work—combines simplicity and sturdiness of construction with the promise of an exceedingly high performance, but not unnaturally it is not considered advisable to describe it in any detail as yet.

Preparations are also being made to lay down a very large multiple engine machine of novel construction, so that within a short time the aeroplane works at Dalmuir may be expected to be in full swing.

As is also well known Beardmores have been continuously concerned with the development of aero-engines since 1911, and have now in an advanced stage of development the new type of vertical engine known as the "Cyclone" which was briefly described in the report of Mr. Chorlton's lecture before the Scottish branch of the R.Ae.S. a few weeks ago. It is further known that a heavy oil injection and compression ignition engine has been developed to the stage where flying tests may be expected in the near future. Unfortunately an official desire for secrecy in regard to these new engines prevented any inspection of the processes of their production.

The flying training school at Renfrew for the R.A.F. Reserve, which is managed by Beardmore's, is now in full swing. The school is equipped with 110 h.p. Le Rhône Avros and with Siddeley Puma D.H.9s, and—subject to the inevitable vagaries of the climate of the Clyde Valley—has been extremely successful.

At the moment of this particular visit, the sheds regularly occupied by the school were in process of being re-roofed and in consequence the school equipment and stores were scattered among the other available sheds. Nevertheless it was possible to see that a very great deal of care and ingenuity has been displayed in the organisation of the school, particularly in regard to the systemisation of the work of maintenance and overhaul of engines and machines.

An ample store of spare parts for both engines and machines is maintained, and a very ingenious system whereby it is possible to see at a glance precisely what amount of work has been done by each engine and aeroplane since its last overhaul has been devised by those responsible.

New Technical Literature.

Aeronautical Research Committee, R. & M. No. 883. An investigation of the Influence of Downwash on the Rotary Derivative Mq. Part II. The Effect of the Airscrew Slipstream. By L. F. G. Simmons and E. Ower. Price 6d. net.

R. & M. No. 884. The Effects of Tip Speed on Airscrew Performance. An Experimental Investigation of the Performance of an Airscrew over a Range of Speeds of Revolution from "Model" Speeds up to Tip Speeds in Excess of its Velocity of Sound in Air. By G. P. Douglas and R. McKinnon Wood. Price 1s. 6d. net.

R. & M. No. 886. Further Experiments on Tandem Aerofoils. By W. Le Page. Price 1s. net

The Journal of the Royal Aeronautical Society. No. 159, *March* 1924. Contents: 59th Annual Report of Council; The Development of High Speed Aircraft, by Major R. H. Mayo; Consideration of the Effect of Meteorological Conditions on Aircraft by Major G. H. Scott and Lt. Col. V. C. Richmond.

United States National Advisory Committee for Aeronautics. Report No. 149. Pressure Distribution over Rudder and Fin of an Airplane in Flight. By F. H. Norton and W. G. Brown.

Report No. 174. The Small Angular Oscillations of Airplanes in Steady Flight. By F. H Norton.

Report No. 175. Analysis of W. F Durand's and E. P. Lesley's Propeller Tests. By M. M Munk.

Report No. 176. A Constant Pressure Bomb. By F. W. Stephens.

Report No. 178 Relative Efficiency of Direct and Geared Drive Propellers. By W. S. Diehl.

Report No. 179. The Effect of Electrode Temperature on the Sparking Voltage of Short Spark Gaps. By F. B. Silsee.

Technical Note No. 168. Experiments with Fabrics for Covering Airplane Wings. By A. Pröll (from Technische Berichte).

Technical Note No. 168. Air Resistance Measurements on Actual Airplane Parts. By C. Wieselberger (from Technische Berichte).

Technical Note No. 170 Reduction in Efficiency of Propellers due to Slipstream. By M. M. Munk (from Technische Berichte).

Technical Note No. 171 Compressive Strength of Tapered Airplane Struts. By Viktor Lewe (from Technische Berichte).

Technical Note No. 172. The Nichols Wing Cutting Equipment. By J. B Ford.

Technical Note No. 173 Significance of the Expression Cl^3/Cd^2 By H. von Sanden (from Technische Berichte).

Technical Note No. 174. Airplanes in Horizontal Curvilinear Flight. By H. Kann (from Technische Berichte).

Technical Note No. 175. Tests on a Model of the D Airplane T39 of the D F.W. By W. Molthan (from Technische Berichte).

Technical Note No. 176 Curvilinear Flight of Airplanes. By E. Salkowski (from Technische Berichte).

Technical Note No. 177. The Relative effect of Dihedral and Sweepback of Airplane Wings. B. M. M. Munk.

Technical Note No. 178. Triplane Tests. By C. Wieselberger (from Technische Berichte).

Technical Note No. 179 Practical Method of Balancing Airplane Moments. By H. Hamburger (from Technische Berichte).

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CONCERNING ANEROID ALTIMETERS.

The altimeter or height indicator used on aircraft is as is fairly well known really an aneroid barometer with a scale graduated to read heights above ground level. The instrument however measures air pressure and nothing else, and that it is possible to use air pressure as a practical measure of height is due to the fact that the rate of change of atmospheric pressure with height above the earth's surface varies only with certain relatively narrow limits.

How the Aneroid Measures Height.

It is therefore possible to assign an average value to the atmospheric pressure at any height above sea-level. For aeronautical purposes the formulation of the pressure, density and altitude relations of an average or standard atmosphere which shall bear a fairly close resemblance to the conditions actually found to exist has an importance which extends appreciably beyond that of measuring height and a good deal of ingenuity has been displayed in the construction of such standard atmospheric relations with a very fair success.

It is however very rarely indeed that the actual pressure at various altitudes agrees with average or standard pressure for those altitudes. From time to time the pressure at sea-level changes through a range equal to that encountered in the average atmosphere in ascending or descending by 2,000 ft. or more. Thus a barometer with a fixed height scale graduated according to any average pressure/height relation might vary in its indications by some thousands of feet over any extended period without any real change of height.

Fortunately variations in the total pressure at sea-level do not greatly alter the rate of change of pressure with change of height. The decrease of air pressure between sea-level and 1,000 ft. above sea-level is approximately 1.1 inches of mercury and this change per 1,000 ft. does not alter seriously whether the barometer at sea-level is standing at 28 or 31 inches. Therefore if a height scale is graduated according to the average pressure change and is adjusted so that the zero of the height scale coincides with the sea-level indication of the barometer the instrument does give a very fairly accurate indication of the height above sea-level, provided that in the period of ascent there is no violent change in the barometric pressure at sea-level.

It should be quite obvious that the aneroid altimeter by itself is not and cannot be an absolutely accurate height indicator because air pressure does not vary with height according to a definite law, but is subject to irregular and often erratic variations which do not depend on height alone. Practical experience, however, shows that the indications of a good aneroid, intelligently used are sufficiently reliable for the majority of aeronautical purposes. Apart from experimental and test flights and for some military purposes a pilot flying at high altitudes does not need to know the height with any extreme accuracy. It is only when he is close to the ground and the ground itself is invisible that considerable accuracy becomes of the first importance.

Hysteresis—Its Effect and Cause.

The first requirements of a satisfactory altimeter for aircraft purposes is that it should always agree with itself. That is to say that if it is set to zero on the ground and is taken up to any height above that ground it should again read zero immediately it returns to the ground.

It is not possible to secure this condition if the barometric pressure has changed in the interval between leaving the ground and returning to it. If the barometer has dropped 1.1 inches in the interval the aneroid can only indicate this drop and on the height scale it will appear to say that the ground is 1,000 ft. above its original position.

But fortunately aeroplane flights are not often of very long duration and a change of barometer reading of anything like one inch in the course of a single flight is very uncommon and is not likely to occur at a time when fog extends to the ground. Also it is likely to be accompanied by atmospheric disturbances which should suffice to warn the pilot against undue reliance on altimeter readings. This source of error is inherent in the method of measuring height by pressure and cannot be cured by any improvement in aneroid instruments.

The majority of aneroid instruments suffer from a defect known as hysteresis which produces an effect equivalent to that caused by a drop in atmospheric pressure during the flight. The instrument does not return immediately to the original reading when it reaches the ground, even though the atmospheric pressure has remained constant in the interval. It returns after a time of rest on the ground but during the whole period of descent the instrument lags in its reading always showing a greater height than is accounted for by the actual air pressure. The trouble is really due to sluggishness in responding to rapid changes of pressure and is increasingly evident as the rate of change of height is increased.

Aneroids are used as altimeters not only on aircraft but for approximate survey work, as their small bulk and ready portability renders them specially popular with travellers. The defect known as hysteresis was known long before the days of the aeroplane but until the aeroplane made it possible to descend from considerable altitudes at the rate of thousands of feet per minute the trouble was relatively unimportant and could fairly easily be kept to within reasonable limits of error. In the case of aeroplanes, however, the trouble is much more serious and it is only by very great care in the design and manufacture of altimeters that hysteresis can be kept to within permissible limits.

The pressure-sensitive element of the aneroid is essentially a form of metallic bellows exhausted of air and extended by a spring. External atmospheric pressure tends to close up the bellows or capsule as it is usually called and the extent of this closing up is a measure of the external pressure. The capsule of the normal aneroid is built up of dished and corrugated discs of thin sheet metal, usually German silver or a similar alloy, which are sweated together at their edges. In some of the more sensitive types of instruments a series of such elementary capsules are joined together in series, soldered joints being employed between elements as well as between the discs composing each element.

The hysteresis trouble is a defect of the capsule and spring and it seems possible that the imperfect elasticity of the metal iself increased by the presence of numerous soldered joints is responsible for the trouble.

Recent Improvements.

Within the last year or two a greatly improved form of aneroid capsule has been developed. This type of pressure element instead of being built up from a series of discs is a single corrugated tube of metal entirely free from joints except for the closing discs at the two ends. Owing to the uniformity of the material and the absence of stiff joints such an element by itself can be made much more perfectly elastic than the usual type of built-up capsule.

The new type of aneroid if properly made and designed is almost entirely free from hysteresis. For aeronautical purposes this recent development in aneroids promises to become of first importance.

Quite apart from the peculiarities of the pressure-sensitive element the aneroid presents difficulties of detail design and construction such as are to be met with in the production of all delicate instruments. It is not possible here to enlarge upon these details but it is hoped that enough has been said to show that an aneroid altimeter if it is to be regarded as a useful and reliable instrument must in the first place be designed and constructed with very considerable care and skill and in the second place must be used with an intelligent appreciation of its natural limitations.

Specialists in Aneroids.

An aneroid of a type which is a perfectly satisfactory altimeter for rough surveys, exploration or mountain climbing work may not be at all a satisfactory instrument for use in aircraft and satisfactory aeroplane altimeters are the product of a very small number of factories. Among these the work of Short and Mason at Walthamstow holds a leading place. The firm dates back to the 1860s and its business is almost exclusively that of manufacturing delicate pressure-measuring instruments.

Short and Mason altimeters are well and favourably known to all concerned with aviation, for their output of these instruments during the War was enormous and little need here be said as to their excellence of workmanship and finish.

Short and Mason now use the new type of one-piece pressure element in their recording altimeters or "Altigraphs." So far as is known they are the only firm in Great Britain using this form of capsule. In their dashboard altimeters the disc type of capsule is still employed, but the hysteresis trouble has been reduced to negligible proportions.

The range of aircraft instruments made by this firm includes normal altimeters for instrument boards, which can be graduated either in feet or metres, reading over one revolution of the pointer for heights up to 17,000 ft. or 5,000 metres and over two revolutions for a range to 26,000 ft. or 7,500 metres. There is also an open-reading, low-range type, reading up to say 3,000 ft. suitable for gliders or light aeroplanes and a special landing-type altimeter reading from zero to 2,500 ft. of very close accuracy and freedom from lag which can be taken to any practicable height without being strained.

The Short and Mason "Altigraphs" or recording altimeters can be made to practically any required chart range and may be graduated in English or in metric measure. The ranges most usually in demand are to 10,000, 20,000 or 30,000 ft., and all these ranges are regularly manufactured.

The firm also make a very sensitive statoscope which is an essential for the accurate determination of aeroplane speeds. The instrument shows changes of level of a foot or so and so allows acurate level flight to be maintained. In all these instruments there is to be found the results of the firm's long experience with sensitive pressure-measuring appliances together with those of a very careful study of the special requirements of aircraft work.

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 18; Tuesday, 17; Wednesday, 20; Tuesday, 18; Friday, 15; Saturday, 10; Sunday, 0.

London—Paris—Zurich.

Handley Page Transport, Ltd., machines 17; passengers 99; freight 6,323 lbs.

London—Ostend—Cologne:

Instone Air Line, Ltd., machines 17, passengers 68, freight 18,500 lbs.

Manchester—London—Rotterdam—Amsterdam—Hanover—Berlin:

Daimler Airway, machines 32, passengers 16.

Paris—London:

Air Union, machines 19, passengers 45, freight 12,651 lbs.

London—Rotterdam:

K.L.M., machines 12, passengers 17.

Special Machines: Berlin—London:

De Havilland Hire, Machine 1, passenger 0.

Total number of trips by British machines: 67, carrying 183 pas

Foreign machines: 31, carrying 62 passengers.

Comparative Figures:

For week ending Mar. 23:

Machines 98, Passengers, 255; Crews, 166; Total personnel, 421.

Corresponding week, 1923:

Machines, 71; Passengers, 234; Crews, 122; Total personnel, 356

Corresponding week, 1922:

Machines, 50; Passengers, 129, Crews, 84; Total personnel, 213.

Corresponding week, 1921:

Machines, 44; Passengers, 168; Crews, 62; Total personnel, 230.

Croydon Notes.

The number of passengers carried during the past week has again been high. This week will see the last of the old firms running as separate companies and on Tuesday next the Imperial Air Transport Company will take over. Up to the time of going to press no appointments have been announced definitely, but a note on the more important officials will be found in another part of the paper.

The companies have all a record of which to be proud. The pioneer company, Handley Page Transport Ltd., have carried the greatest number of passengers and their safety record has been wonderful. They have had only one serious accident and that was right back in 1920. Since then they have not damaged a single passenger.

The Instone Air Line have had a clean record so far as damage to passengers is concerned. They have done wonderful pioneer work in carrying freight by air. They have during the past year gone full out for goods traffic between London and Cologne and the success which they made of this reflects a considerable amount of credit on Mr. Eskell, the energetic traffic manager. He should be assured of a post in the new company.

The Daimler Airway were the latest of the three companies and in the course of two years' operations they have practically revolutionised air transport. The number of passengers carried by them has been small, but this has been because they have been working undeveloped routes, whereas the other firms had already developed the route on which they had to work.

Everyone will wish success to the Imperial Air Transport Company on its inception.

The Shawless Sea.

It has been rumoured that Mr. "Jerry" Shaw, of Shell-Mex Ltd., owing to his previous experiences of immersion, was to be the pilot of the D.H.18 in its forthcoming alighting test in the sea off Felixstowe Although no more fitting pilot for such an event could have been selected and although Shell and Sea and Shaw are always somehow or another connected, one understands that the test will be done by a test pilot from the Air Ministry.

The Royal Aero Club's General Meeting.

The Annual General Meeting of the Royal Aero Club will be held at 3, Clifford Street, on Monday next, Mar. 31, at 6.0 p.m. (not 5.0 p.m., as previously announced).

The following Members have been nominated for the nine vacancies on the Committee:—Group-Capt. F. W. Bowhill, C.M.G., D.S.O., R.A.F., Major-General Sir W. S. Brancker, K.C.B., Ernest C. Bucknall, The Lord Edward A. Grosvenor, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. M. O'Gorman, C.B., Air Commodore C. R. Samson, C.M.G., D.S.O., R.A.F., Sir Mortimer Singer, K.B.E.

The number of candidates nominated not exceeding the number of vacancies, no ballot is necessary.

The business includes the following:—

To add to Rule 50 as follows:—The subscription for members who are officers serving in the Royal Air Force or the Royal Air Force Reserve, or officers (past and present) engaged in the Air Ministry Departments, shall be £2 2s. per annum.

Motion by Cmdr. F. L. M. Boothby, R.N.:—"That the Royal Aero Club should encourage all practicable branches of Aeronautics alike, and that an equal proportion of the Club's energies and funds should be devoted to airships, aeroplanes and seaplanes."

Presentation of the Gold Medal of the Royal Aero Club to Lt.-Col F K. McClean, A.F.C

More Uncivil Aviation.

When a Farman Goliath was leaving Le Bourgêt on Wednesday the 19th three revolver shots were fired at it by an employee of the aerodrome. He was immediately arrested as might be expected. The passengers and pilot escaped unhurt but the man managed to hit the tailplane of the machine which in these luxurious days had to be repaired before the journey was begun.

Air Letters Wanted.

A collector of curiosities in the United States is anxious to obtain a letter or postcard (together with stamp) carried by the Smith brothers from London to Australia. He also wants a similar card or letter carried by Messrs. Alcock and Brown on their trans-Atlantic trip. He is willing to pay £10 apiece for such curiosities. If any reader of The Aeroplane has one to sell, or can find one, he or she is invited to communicate with the Editor.

New Companies.

Central Aircraft Co., Ltd. (196,470).—Private company. Registered Mar. 18. Capital £26,000 in 2,900 8 per cent cumulative preference and 23,000 ordinary shares of £1 and 2,000 founders shares of 1s. To take over the business carried on by Mrs. A. Cattle at 179, High Road, Kilburn, N.W., and elsewhere as the Central Aircraft Co.

The first directors are:—A. J. Cattle, 179, High Road, Kilburn, N.W.6.; C. H. Cattle, 179, High Road, Kilburn, N.W.6.; B. M. Gillett; O. E. Twigg, P. Bolton, W. Hancock.

Qualification: 1 share. Remuneration: £50 per annum. Solicitor: A J. Adams, 1, Verulam Buildings, Grays' Inn, W.C. Regd. office: 179, High Road, Kilburn, N.W.6.

The Automobiles Hispano-Suiza (Great Britain), Ltd., was registered as a Private Company on Mar. 20, with a nominal capital of £3,000 in £1 shares. The objects are: To take over the agency for Great Britain and Ireland of Société Française Hispano-Suiza of Bois-Colombes, Paris, France, carried on at 71, Carlton House, Lower Regent Street, S.W., as Automobiles Hispano-Suiza, and to carry on the same and the business of manufacturers and sellers of motor-cars and vehicles, aeroplanes and similar machines, etc.

The first directors are:—M. Emile Mayen, 19, Rue St. James, Neuilly Sur Seine; Marc Birkigt, 21, Avenue de Versailles, St. Cloud; Jean Lacoste, 187, Rue Armand Sylvestre Courtevore, France; Major F. W. K. Davies, 71, Carlton House, Regent Street, S.W.1, engineer; F. J. Strover, 16, Tokenhouse Yard, E.C. C.A.

Qualification: £200. Secretary: S. Lattimore: Solicitors: Mann and Co., 17, Essex Street, Strand, W.C. The registered office is at 71, Carlton House, Regent Street, S.W.1. The file number is 196,539.

PERSONAL NOTICES.

Deaths.

PARSONS.—On Mar. 19, suddenly, G. A. Parsons, General Manager of The Palmer Tyre Ltd.

[Those who have been concerned with the development of aircraft and who know the difficulty of the work which has been done in securing satisfactory tyres and wheels will regret to hear of the death, which took place suddenly on Mar. 19, of Mr. G. A. Parsons. It is thanks very largely to the foresight and business acumen of Mr Parsons that the Palmer company has to-day practically a monopoly of the business in wheels and tyres for aircraft. All who have come in contact with Mr. Parsons recognise his ability as a business man, and his personal charm always made it a pleasure to talk business with him. The British business community can ill spare a man of his quality.—C. G. G.]

Flt. Lt. Tilman, whose death was announced in The Aeroplane on Mar. 19, was killed while taking part in the Fleet Exercises in the Mediterranean. His machine crashed just off the northern coast of Mallorca.

Engagement.

WEARE—CHERRY-DOWNES.—The marriage between Flt. Lt. F. G. C. Weare, M.C., and Miss Cherry-Downes will take place at St. Paul's, Knightsbridge, on Apr 30

Births.

HAY.—On Mar. 22, at Sherfield Manor, Basingstoke, the wife of Flt. Lt. J. C. M. Hay, R.A.F.—a daughter

MOCKFORD.—On Mar 21, at Croydon Aerodrome, to Winifred, wife of F. Stanley Mockford—a son.

WALLACE BARR.—On Mar. 22, at 10a, West Chapel Street, Mayfair, W.1, to Sylvia, wife of A. J. A. Wallace Barr—a son.

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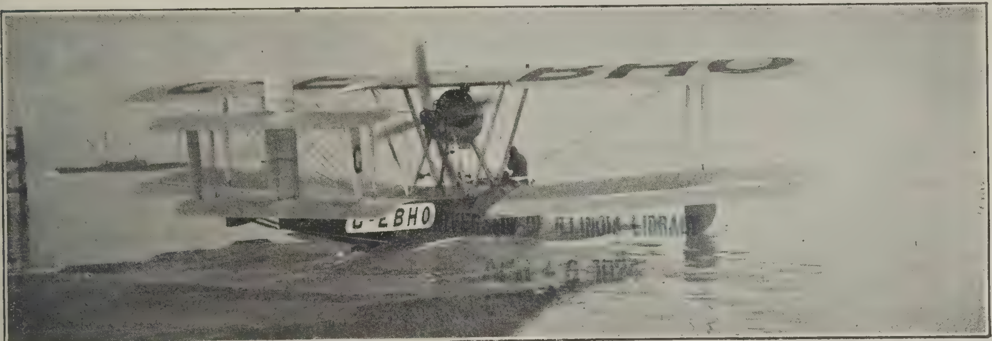
THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXVI. No. 14. SIXPENCE WEEKLY. Registered at the G.P.O. as a Newspaper.

THE TEST MATCH.



THE BRITISH INNINGS :—Squadron-Leader Archibald S. C. Maclaren (skipper) and the British Team going in at Calshot, on March 25, in the globe-trotting match against the Americans who started on March 15.

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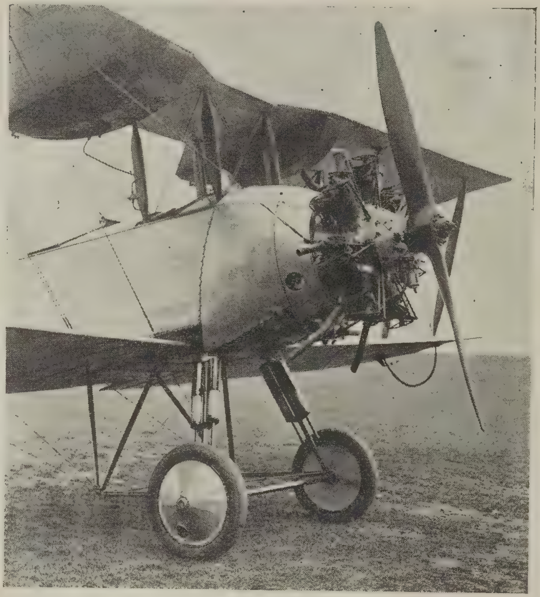

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APRIL 2, 1924.

VOL. XXVI. No. 14.

THE AEROPLANE

Incorporating

Aeronautical Engineering

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ON ALL FOOLS' DAY.

At various times in the course of the past ten years or so this paper has drawn attention to the trouble which continually arises in the production of new types of aircraft and engines through delays in placing contracts. What generally happens is thuswise. A large sum of money is voted by Parliament in March for new types. Then the technical people play with designs and samples for about six months. And then a few orders for specimens are placed in the Autumn so late that it is impossible for deliveries to be made before the end of the financial year on Mar. 31. The result almost always is that on Apr. 1, the appropriate date for the beginning of the new financial year, a very large proportion of the money originally voted has to be returned to the Treasury.

In this way the Treasury has succeeded annually in making April fools both of the Air Force and of the Aircraft Industry. The former does not get the new aircraft which it has always needed so badly and the latter is deprived of the money with which it had hoped to establish itself as one of the nation's great and progressive industries.

Particular attention was drawn to this point in the Debate on Air Estimates on Mar. 20 by Sir Harry Brittain, who said:

> I am encouraged to bring this matter forward by a statement in a previous speech of the Under-Secretary in which he, quite rightly, dwelt on the necessity of the continuity of work. For the purpose of economy, and to facilitate the manufacture of aeroplanes and engines, I suggest that orders should, if possible, be extended over a longer period than that of a single year. It takes at least two years to bring out an aeroplane from design to production, and it takes three years to produce an engine. After the design of the engine has been approved, it takes, roughly, nine months to build it, from the time that the materials are ordered until the machine is finally completed and tested. Therefore, on the one year basis we are not only operating in a way which is detrimental to production, but in a way that is very wasteful so far as the money of the country is concerned.
>
> When the orders are being given out, the estimates are passed in April and sometimes as late as May. By the time the manufacturers receive their orders, which are often preliminary, July has arrived, and it is necessary for the manufacturers of the machines or the planes to deliver by the end of March, that is, the end of the financial year, with the result that there must be scramble and excessive cost for materials and overtime. By this method it is almost impossible to keep the works in production, and it is equally difficult to retain what we all wish to retain, the skilled workmen who are necessary. The same applies to the skilled workmen in the cognate factories who have to supply the ingredients of the planes and machines in the shape of castings, etc.
>
> If this were once realised and rectified, it would make a very great difference to regular employment in the works of this country which are turning out the planes and the engines, and it would mean a very considerable saving to the country as a whole.

Unfortunately space was lacking last week in which to say anything on this subject beyond indicating that Sir Harry Brittain pointed out the delay which had occurred in producing new types. And in any case the subject is so important that it deserves special attention instead of being merely lumped in with the rest of a very uninteresting debate.

It is earnestly to be hoped that this subject will receive special attention from the new political chiefs of the Air Ministry. There has always been a continual war between the chiefs of the Supply Departments of the fighting Services and the officials of the Treasury. Undoubtedly this war does conduce to the saving of the taxpayers' money but it also conduces to stagnation in design, which means that our fighting men are continually condemned to do their work with obsolete weapons.

One gathers that our previous Secretaries of State, Captain Guest and Sir Samuel Hoare, have been very much in favour of placing orders for new types on a definite contract operating for two or three years as may be necessary instead of terminating automatically on Mar. 31 as at present. Mr. Leach, the present Under-Secretary, has also expressed his appreciation of the necessity for continuity of work, as Sir Harry Brittain stated. Therefore it is obvious that the chiefs of the Supply Department at the Air Ministry have the support of the political authorities and consequently it becomes a question as to whether the permanent officials of the Treasury can be thus influenced to assist progress instead of hampering it.

As Mr. Philip Snowden remarked recently a Secretary of State has responsibility without authority whereas a permanent official has authority without political responsibility. One does not believe for a moment that the permanent officials of the Treasury deliberately hamper progress. But of necessity these financial experts cannot also be experts in technical matters of aviation or even in matters of workshop procedure. Nevertheless they are as a rule reasonable human beings and it is probable that if their political chiefs assisted by the technical people at the Air Ministry put the case to them in a sufficiently persuasive manner the Treasury officials might consent to placing with aircraft firms contracts extending over several financial years just as they consent to the placing of similar contracts with ship-building firms.

One believes that the Treasury consents to the placing of such contracts by the Works and Buildings Department of the Air Ministry. In fact a study of the Air Estimates shows that such contracts actually exist. Consequently there seems no good reason why similar contracts should not be placed with the builders of aeroplanes and aero-engines.—C. G. G.

ON FLYING CLUBS.

Something was said in Parliament the other day about official encouragement of flying clubs. This is a subject about which there has been much debate among everybody concerned with flying ever since flying began. It is fairly evident that flying is much too expensive a game ever to become a sport on the "one man one aeroplane" basis. People talk glibly about the light aeroplane becoming the motor-cycle of the air but they always forget that the cheapest possible aeroplane costs roughly five times as much as a good motor-cycle and probably ten times as much to run.

Also they forget the axiom so often laid down in this paper that by the time a man can afford to buy and maintain an aeroplane he is sufficiently rich to become a fair mark for some designing female and that therefore his aeroplane has to be a two-seater and so all his expenses are increased. The situation is in fact something rather like that envisaged by a hard-up young man many years ago when he remarked:—"The worst of taking a girl out for the evening is that you first of all raise your standard of living and then double it."

The fact is that, as has also been stated in this paper on various occasions, flying is absolutely a co-operative sport just as air-transport is a co-operative business. The problem is how to induce people to co-operate.

The general idea seems to be that the light aeroplane is going to solve the problem in that it ought to be comparatively cheap to buy and probably cheaper still to run and maintain. It certainly should be possible to buy quite a respectable two-seater light aeroplane for somewhere about £250. But one can also acquire a very good "disposal" war-time machine for even less money if one knows how to set about it. Where the light aeroplane does score is in being cheaper to house and cheaper to run.

On the other hand one does not believe that the two-seater light aeroplane is going to be anything like such a comfortable and comforting vehicle for cross-country flying as would be the tried and proven war-time machine. Personally one would rather fly across country on a resuscitated Avro or Martinsyde or D.H.9 than on any two-seater light aeroplane with an unfortunate little motor-bicycle engine screaming round at 4,000 r.p.m.

However, the flying club idea seems to have taken the fancy of many people, including some in the Air Ministry. And it is hoped on the best authority that even the hard-hearted and hard-headed Treasury may be induced to consent to the expenditure of Air Ministry money on the encouragement of flying clubs.

It certainly would be a good idea if something were done in this direction. For example if the Air Ministry would put up the money for the purchase of half-a-dozen assorted single-seat and two-seat light aeroplanes of an approved type on the condition that the club would raise sufficient capital to assure the proper care and housing and maintenance of those machines it should be possible to run clubs at most of the big industrial centres. Naturally the Air Ministry would want something for their money and presumably the users of the machines would be required to join the R.A.F. Reserve. It might not perhaps be a definite condition of joining the club but at any rate it ought to be a sort of understanding that members who got as far as taking their "A" licence as civilian pilots should join the Reserve.

Naturally under those conditions the Air Ministry would not only have to provide the initial cost of the machines but would have to undertake some sort of annual allowance at the rate of something like 25 per cent. of the original sum for replacements, and the Air Ministry would have to arrange for the inspection of the club's machines free of charge. On the other hand the club would have to provide a competent ground engineer to oversee the maintenance of the machines, but that should be no more difficult than the provision of a ground-man by a cricket club. Also there should be a qualified pilot instructor for the benefit of members learning to fly and he should have the power definitely to forbid flying by incompetent or reckless pilots.

There must be in this country many thousands of young men who would like to join such clubs. In the drawing office of practically every aircraft firm there are at least half-a-dozen budding designers who would be delighted to have the chance of flying at a reasonable price. At Glasgow University, as Captain Sayers pointed out a week or so ago, there is quite a number of intelligent young men who want practical experience and probably an equal number of similar youths could be found in most of our big modern universities, even though the Faculties of the two senior universities may not approve of flying undergraduates.

The chief difficulty about the formation of such clubs would appear to be the matter of initial capital and the finding of a suitable aerodrome. If such a club were started where no flying had been done before it might possibly hire a suitable field for a matter of £50 or £100 a year and a quite adequate shed could be built for about £400. In a really enthusiastic club the mechanical work would probably all be voluntary but quite sufficient skilled labour to maintain half-a-dozen light aeroplanes could be hired in any case for a matter of £500 to £750 per annum. If an Air Ministry aerodrome were used the high price of landing fees and of housing machines might raise the expenses considerably.

Probably twenty members at £5 a head would be sufficient to found a club. But naturally if the club were run on a bigger scale it would be better, and if some local man of importance could be found to put up a couple of thousand pounds so as to set the club firmly on its feet at the start it would be very much better.

The success of such a club must depend on the energy of one particular individual. Every successful club has depended in the earlier years of its life on the industry and driving power of either its chairman or its secretary. Either the chairman inspires a competent secretary to good work or else an energetic and ambitious secretary induces an affable committee to do as he wishes. Actual government by committee is invariably a failure.

The difficulty always is to find sufficient inducement to make it worth one man's while to devote himself to such a task. In this instance it might amuse an ambitious young man to endeavour to make himself the aeronautical leader of his own particular community or perhaps some elderly and wealthy person might be pleased at the idea of becoming the patron of the new sport. A combination of the two would probably be the more satisfactory.

Nevertheless it is to be hoped that here and there in this country young men may be discovered who will found and guide to success a number of flying clubs. There is quite a number of local automobile clubs and football clubs and so forth each of which owes its initial success to the energy of an individual. Surely there must be among the youth or the younger middle-aged men of to-day those who can achieve similar success with flying clubs.—C. G. G.

BEGINNING OF IMPERIAL AIR TRANSPORT

The coming into being of the Imperial Air Transport Company has been heralded with a certain amount of industrious unrest in which the chief bone of contention has been the pay of the pilots. As in every other case there are certainly two sides to the question. The alleged proposal of the management of the Company was that pilots should be paid a retaining fee of from £100 a year to £200 a year according to seniority and that 2d. per mile extra should be paid for distance flown. Under present conditions pilots are paid from £450 to £550 per annum with additional flying pay of 10s. per hour. If therefore a pilot flies for 600 hours he may receive up to £850 a year.

Some time ago a Union of Pilots was formed which included all the Croydon pilots and the De Havilland pilots. This union which is affiliated to the Transport Workers' Union is insisting on the old rate of pay being retained.

With payment on the mileage system the pilot who flies a fast D.H.34 scores considerably over a pilot flying an 0/400 or a W.8b. One can imagine a pilot flying on the surviving 0/400 against a 60 m.p.h. wind wondering if he is ever going to earn another 2d. One also wonders whether supposing the speed of the wind were higher than the speed of a machine a pilot could be fined 2d. for every negative mile which he covered.

The latest news is that at a meeting held at the aerodrome on Saturday a Federation of Aircraft Workers was formed which includes both the pilots and the mechanics. Mr. Ben Tillett of the Dockers' Union and Mr. Bob Williams of the Transport Workers' Union, who tried to run the Triple Alliance strike a couple of years ago, were present.

There is the point that by forming into a trade union the pilots are lowering their status somewhat from that of officers and gentlemen, on which rests to some extent their claim to be paid more than engine-drivers who bear greater responsibility, but there is no getting away from the fact that under present conditions some such association has to be formed for mutual protection and by the law which governs the formation of trades unions any such union is illegal unless it be affiliated to the main body.

THE OFFICIAL VIEW.

The following statement was issued on Mar. 31 on behalf of the Directors of Imperial Airways Ltd. :—

A first meeting of directors was held yesterday (Monday) afternoon of the new national transport company which is to absorb to-day (Tuesday) the four existing operating companies—viz., Messrs. Handley Page, Instone Air Line, Daimler Hire, and British Marine Air Navigation Company.

The new national enterprise, with a capital of £1,000,000, and subsidised by the State with another £1,000,000 spread over a period of ten years, is to be known as "Imperial Airways Ltd."

It was decided by the directors, in view of the necessity of centralising the systems of operation, inspection, and control, in connection with the various staffs, and aeroplanes of different types, as employed up till yesterday (Monday) by the four companies, that the aerial services to and from the Croydon air station should be suspended temporarily, as from to-day (Tuesday) for a short period.

The terms of employment were considered which are to be offered pilots who will fly for the new company. In this regard statements are erroneous which suggest that any pilots at the air-station were "on strike" yesterday (Monday). Until last night they were still in the employment of the four existing companies, and the new Imperial company has, as yet, made no appointment of pilots.

The directors decided that, in the case of pilots who pass the rigorous medical tests which will be imposed, terms should be offered which, in the form of an annual retainer and "flying-time" pay, will ensure an annual income of £750 to £850, according to seniority, to pilots. For this they will be required to fly approximately an average of two hours a day.

The records of the existing companies show that the average earnings of pilots, during the past 20 months, have been in the neighbourhood of £600 a year.

The suggestion is quite untrue, therefore, that there is any intention to effect "drastic cuts" in the salaries of aeroplane pilots.

It is now permissible to add that the offer actually made to pilots is a definite salary of £400 per annum to new pilots up to £500 per annum to more experienced pilots in addition to which they will receive flying pay at a rate per mile to be fixed later.

On a mileage basis the pilots of slow freighters will naturally earn less than will the pilots of high-speed passenger machines. The newer pilots will handle the slow machines and the more experienced or better pilots will handle the fast machines. This is precisely analogous to the driving of goods trains by new drivers while the older and better men are put onto express-driving.

The arrangement seems not only fair but generous. And it will be seen that air line pilots will in fact be better paid than are regular pilots (other than commanding officers) of the Royal Air Force.

It is well to add that there was never any "strike" of pilots. The engagements of all pilots ended on Mar. 31, and they were merely offered engagements on certain terms by the Imperial Air Transport Co. Ltd. Pending engagement of personnel and the overhaul of flying stock the various services are temporarily suspended.

A new aerial transport company was registered on Mar. 31 under the name of Imperial Airways Ltd., this being apparently in succession to the Imperial Air Transport Co. Ltd.

The board of the company is constituted as follows :—

The Rt. Hon. Sir Eric Geddes, G.C.B., G.B.E. (Chairman), Sir George Beharrell, Kt., D.S.O., Lt.-Col. Frank Searle (Managing Director), Lt.-Col. J. Barrett-Lennard, Sir Samuel Instone, Kt.

Major J. W. Hills and Sir Herbert Hambling, Bt., will be appointed by the Air Ministry as Government Representatives.

There will be one further addition to the board.

Colonel Searle is apparently still managing director of Daimler Hire Ltd.

Major Woods Humphery, who has been general manager of Daimler Hire Ltd and of the subsidiary Daimler Airway has been appointed general manager of Imperial Airways Ltd. His success in organising intensive flying on the Daimler Airway augurs well for the efficiency of the new concern.

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Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Britanicos.

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéreos.

Diseñadores y constructores de hidroaviones, barcos, aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de aparatos especialmente adecuados para el levantamiento de cartas topográficas y fotográfias, hangares flotantes y completo equipo para estos mismos.

Diseñadores, por orden especial del Gobierno Británico del barco aéreo más grande que se ha construido para este gobierno.

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STILL MORE AIR DEBATES.

By C. G. GREY.

THE AUXILIARY AIR FORCE.

Unfortunately space was lacking last week in which to record the introduction by Lord Thomson, Secretary of State for Air, of the Auxiliary Air Force and Air Force Reserve Bill, in the House of Lords on Mar. 20.

LORD THOMSON explained that the purpose of the Bill was to enable the Air Ministry to start recruiting on a suitable basis for the 13 non-regular squadrons which would form part of the Air Force Home Defence Force. New powers had to be obtained because it was found that enactments relating to the Army Reserve and Territorial Army could not legally be adapted to the Air Forces in such a form as would enable them to be organised according to the exigencies of air defence. Power was sought in the Bill to extend the power of His Majesty in Council in regard to organisation and administration.

The Secretary of State said that it would be possible under existing powers to establish Auxiliary Force associations on a county basis but it had been found that this method was not sufficiently elastic. The system of County Joint Associations might be necessary in certain cases. Provision was also made for a third contingency in which an Auxiliary Air Force Association might exist not for one county but for two counties or for a large industrial centre or group of towns.

As to special needs of air defence he said that the terms of enlistment had to include the liability of the personnel to be called up. This could not be left to a voluntary offer on the part of each officer and man as in the case of the Territorial Army.

Further Lord Thomson said that power was taken in the Bill to adapt the Act of 1917 which made it obligatory for any would-be officer or recruit of the Territorial Army to accept liability to serve within the British Isles against actual or apprehended attack independently of the embodiment of the force.

It was necessary to define a flight on home service. Such a flight was one *in which the points of departure and intended return* were within the British Isles or the territorial waters thereof. Nevertheless a flight might extend beyond those limits and such a flight would be defined as a flight on home service.

The primary function of the Auxiliary Air Force was the same as that of the Territorial Army, namely, that of home defence. They hoped to use six squadrons of the Auxiliary Air Force for that purpose. Recruiting for two squadrons in the London area would be started in the late Summer and for another squadron near Glasgow in the Autumn.

On the subject of the Special Reserve Lord Thomson said they were going to form several Special Reserve Squadrons for the Home Defence Force. These squadrons would consist roughly of two-thirds of special reserve personnel and the other one-third regulars. To man these squadrons a new category of special reservists had been created whose obligations would be confined to serving within the British Isles. The reason was that the Air Ministry were endeavouring to get not only men who were willing to serve as citizen soldiers in the Territorial Force but also those who desired closer association with the Regular Force. The Bill conferred specific power to enlist men in the Air Force Reserve without liability to serve abroad. At least one Special Reserve squadron would be called up in the Autumn and there might be two or even more.

The Bill provided for an Order-in-Council declaring a state of emergency and ordering the Secretary of State to give and when given to revoke or vary such directions as might seem necessary or proper for calling out the Auxiliary Air Force or the Air Force Reserve or both.

The organisation of these forces, he said, was largely experimental. The Auxiliary Air Force Squadrons were to be associated with industrial areas, and the Special Reserve units would be raised and provided with peace aerodromes in the vicinity of selected industrial centres. Thus it was hoped that it would be possible to attract skilled mechanics who would require the minimum of special training for home defence work.

THE EARL BEAUCHAMP, THE MARQUESS OF LONDONDERRY, and THE LORD CHANCELLOR (THE VISCOUNT HALDANE) respectively gave their blessings to the Bill.

In concluding the debate Lord Thomson said that it was intended in the beginning to make use of the Territorial Associations and the necessity might never arise to set up the other associations for which power had been taken. He added that there was an agreement with the Imperial Air Transport Company for all their pilots and technical personnel to belong to the Air Force Reserve. Further he said that no effort would be spared to stir up enthusiasm in aviation. They had to get people into the air but he had not yet decided whether they would have to do it by means of airships or aeroplanes.

MORE AIR IN THE COMMONS.

On Mar. 21 on the Motion for the Adjournment there was more talk on Air Forces.

LIEUT.-COMDR. KENWORTHY, returning to his advocacy of opportunities for poor boys, suggested that the Air Council should abolish all fees at Cranwell so that the Services should not be the prerogative of any one class of the community. He said the matter rested with the Treasury as he understood that the Admiralty, the Army Council and the Air Council were all favourable to the free education of officers.

In this connection Mr. Kenworthy raised a very interesting point. He recalled the fact that before the outbreak of war in 1914 when there was trouble in Ireland certain Army officers in the camp on the Curragh objected to carrying out the policy of the Government of that day. He at that time commanded a ship at Plymouth and there were actually meetings of naval officers commanding ships to decide what their action should be if they were ordered to proceed against the Orangemen in Ulster. They were divided into three sections. One small section wanted to hoist the Orange flag and rally their crews, if they could persuade them, on the side of the Ulster rebellion. Another section, the largest, held the view that they could not mix in politics and must carry out orders. The third section to which he was now ashamed to confess that he belonged said "We object to the Navy being used for police work. We are faced with a very serious German menace (we believed so at that time in 1914). We consider the Navy should only be used for fighting external foes. We object to it being used in an internal dispute. Affairs may develop into a civil war."

He admitted now that this section was absolutely wrong. Their duty was to obey the orders of the Government. He argued that the incident which he recalled showed the danger of one class being influenced by political parties to hamper the arm of the executive and that the best way to avoid such a danger was to have a democratic officer class. He added that this was done in America, in France and in Japan.

Personally one feels rather inclined to agree with Mr. Kenworthy for the very good reason that in these days it is precisely the gentlefolk of this country who are so impoverished that they find difficulty in paying the fees necessary to put their sons into the Services and they find still more difficulty in providing uniform and equipment. It is probable that by abolishing all such expenses we should get a very much better class of officer in all the Services than we have at present. One knows personally of many cases in which boys of precisely the right class have been unable to become officers in the King's Service simply because of lack of means.

MR. BLACK raised the subject of chaplains in the Royal Air Force and wanted to know whether adequate provision was made for the different religions. Also he objected to the high salaries paid to chaplains in that a single chaplain started at £520 per annum and could rise to a maximum of £1,168 per annum, against which in the Army a thoroughly trained medical Captain after ten years' service only received £809 and a married Major after fifteen years' service only £973. He said "I cannot see that it is in harmony with equity and fairness that a chaplain who has nothing like the serious duties to perform that a Major in the Army Medical Corps has to undertake should be able to receive a higher maximum salary."

It strikes one that this argument depends entirely on the personal point of view as to whether the cure of souls is or is not less important than the cure of bodies.

MR. R. S. WELLS lamented the omission of airships from the Air Estimates, apparently chiefly because in his constituency there is a large airship station belonging to the Government which includes fifty or sixty empty houses which are being kept empty pending the Government's decision on the subject of airships although there is a shortage of houses in the area.

AND YET MORE DEBATE.

On Mar. 24 there was another debate on the Air Estimates in the report stage.

LIEUT.-COMDR. BURNEY endeavoured to say that the amount of money necessary for the pay of the Air Force could be reduced if the number of men were reduced by adopting some wonderful scheme for co-ordinating the technical services of the Navy, Army and Air Force. He was ruled out of order as the debate was specifically on the subject of pay and not on technical affairs.

LIEUT.-COL. LAMBERT WARD objected that £38,252 was rather excessive pay for the meteorological people considering the small amount of flying which is done.

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MR. BLACK again attacked the salaries of the chaplains.

LIEUT.-COL. MOORE-BRABAZON said that meteorology was a second-class science and that the great brains in the country were not concentrated on it and that we know nothing about the weather at all. At the same time he said that this did not mean that the meteorological office was inefficient, it merely meant that the science was not understood. He wanted more money devoted to research in meteorology.

MR. ACLAND was concerned to know whether "the normal commercial aeroplane which is likely to be developed in the next few years will when fitted with the ordinary equipment serve the purpose quite well and be available as a bombing aeroplane" and whether it was possible to find "some way out of this terrible business of starting a competition in bombing aeroplanes which leads straight back to barbarism and the destruction of civilisation altogether."

REAR ADMIRAL SUETER thanked the Secretary of State for sending him replies to his questions on the recent air debate. Referring to £1,913,400 which had been expended on complete machines he asked whether the firms had had their money paid for completed machines or whether they were to be delivered by the end of the financial year and he also inquired about £940,000 expended on 800 engines. And he wanted to know why we only had 80 first line machines for nearly £3,600,000.

He also wanted to know whether "that great inventor who is dealing with helicopters at Farnborough" had got his machine into the air yet (the reference is to Mr. Brennan on whom some hundreds of thousands of pounds have been spent.) He also wanted to know whether the Royal Aircraft Establishment at Farnborough had produced anything for the £401,000 spent on them He wanted to know whether the grant to the National Physical Laboratory was sufficient to enable them to carry out their tests properly.

MR. HARDIE raised the useful point that we get all our petrol from abroad and remarked "You seem to get tired when you are asked to complete the matter by producing your own juice for your engine."

After which there followed an amusing conversation which should be described rather as back-chat than as debate. It ran as follows :—

REAR-ADMIRAL SUETER : We store a lot of it in this country.

MR. HARDIE : I know about your stores, and I also know something else. The other people who would like to be sending aeroplanes here know where your stores are.

REAR-ADMIRAL SUETER : They did not hit them in the last war.

MR HARDIE : No but they were not so efficient as I understand they are going to be in the next war. Your argument does not hold. What I am arguing on is this : The absolute independence from outside sources for defence. If I believed as hon. Members opposite believe, I would never rest until I got this circle complete. In this country you can make all the juice you want for your machines. In the petrol you get from abroad, you are still troubled with certain deposits that stir up troubles in your engine. You can get rid of it by manufacturing something better, which you can do in this country.

REAR-ADMIRAL SUETER : Can you manufacture as economically as we can get petrol ?

MR. HARDIE : Yes, cheaper.

REAR-ADMIRAL SUETER : What is it ?

MR. HARDIE : Industrial alcohol. (AN HON. MEMBER : "Whisky !") No, not whisky. You could not trust the Air Force with whisky. It would get into their own combustion chamber. Not only can we make industrial alcohol—(AN HON. MEMBER : "Drink it !")—we can de-nature it to prevent anyone from drinking it. (AN HON. MEMBER : "No cheers !") No there are no cheers for that. You cannot drink it after it has been de-natured. Other countries have been showing us the way for years

Unfortunately Mr. Hardie omitted to mention that as far as present knowledge goes industrial alcohol does not produce anything like the power for weight and volume which is given by petrol.

LIEUT.-COL. HOWARD-BURY tried to raise the whole question of co-operation of the Staffs of the three Services.

MR. E. BROWN endeavoured to raise the subject of disarmament and was called to order by the Speaker on the grounds that the House was now discussing supplies and not policy.

MR. LEACH replied in a speech which was described by Lieut.-Colonel Sir Philip Richardson as "unconvincing." As a matter of fact it would be much better described as reassuring in that it contained no information, and it is a recognised fact that no news is good news.

SINGAPORE AGAIN

In the Debate on the report stage of the Navy Estimates on Mar. 25 SIR ROBERT HORNE made the statement that the existing docks at Singapore cannot even take in our ordinary aeroplane carriers still less those "bulged" capital ships which are supposed to be thus protected against the submarine. This statement was contradicted by MR. AMMON, Parliamentary Secretary for the Admiralty, who said that the docks could take 10,000-ton cruisers and could take all the carriers with the exception of one.

MR. G. LAMBERT disclosed some very interesting figures concerning the Singapore scheme. He said—

> We have, according to a reply which was given to me yesterday, the main items, with their cost, contained in the £10,000,000 estimate. I find it says :—"Works common to all departments, namely, wharf walls, basin, railways, roads, water supply, drains, dredging berth for floating dock, etc., £5,100,000; graving dock another £1,000,000; officers, residence, etc., £420,000; workshops £700,000; magazines £610,000; storehouses £470,000.'
>
> These figures, I say, were given me yesterday. There was a significant fact at the end of the answer which said :—
>
> "Estimate of £10,500,000 includes no provision for aeroplanes or military defence."
>
> What about the aeroplane defence at Singapore ? What is to be the cost of it ? Can anyone give me any estimate ?

From these figures it may be noticed that the vast majority of the expenditure was to have been incurred simply and solely in making a dockyard and not in making Singapore into a great supply base for a fighting force.

An interesting fact was also elicited by Mr. Lambert that the "revised scale of land armament if the new docks were proceeded with has not been laid down."

Later in the debate VISCOUNT CURZON charged Mr. Ammon with having given false information to the House and said that he was perfectly certain that the Furious, the Courageous and the Glorious now being converted and the Eagle could not get into the dock, and he very much doubted whether the Hermes could. Mr. Ammon said that the Eagle was the only one which could not.

Viscount Curzon said that he did not believe the statement, whereupon various honourable Members demanded that he should withdraw that phrase. He however said that he was not going to withdraw because he had put the question to the Admiralty about this and had been told that no bulged ship could use the dock at Singapore and all the aircraft-carrier ships were bulged. Mr. Speaker remarked that there was very often a conflict of opinion in the House and that they must take the Noble Lord's opinion for what it was worth.

LIEUT.-COMDR BURNEY remarked that the two ships which were going to be converted as aircraft carriers would not be able to go into the dock when they were converted and that the Parliamentary Secretary was "technically and momentarily" correct.

One can only suggest that if our carriers cannot get into the dock at Singapore that will be just that much safer from being bombed in a sudden Japanese raid. If they should be in the harbour when the raid starts they have at any rate a change of getting under weigh and being harder to hit. And if before the raid arrives they are in such a state as to require docking then they will probably be some thousands of miles away from the raid.

Later in his speech Viscount Curzon quoted Lieut.-Commdr. Kenworthy as saying on Dec. 10, 1919 :—

> The great flight to Australia which has been so happily completed to-day passed through Singapore. Singapore is not only a great strategic point from the naval point of view but also from the aerial point of view.

This bit of prophecy should be accounted unto Mr. Kenworthy for righteousness as should also a later remark of his on Mar. 18, 1920, when he said :—

> Every bit of money spent on Wei-hai-wei is sheer waste and might as well be thrown into the sea. I would suggest that the money might be spent on Singapore, which is going to be the most important strategical point in the world. It is a model point for sea routes as well as for air routes, and is unique. I should like to see a development of Singapore as a naval air base.

Discussing the question of fortifications of Singapore Viscount Curzon recalled the fact that Scapa Flow during the War 1914-18 was the main base of the biggest battle fleet the World has ever seen. The armament was nothing more than a few 12-pounder guns but there were three lines of nets at the main entrance and several lines of mines and he added "There is no necessity to have much more than that in order to protect a dockyard at Singapore if at the same place you have an efficient aerodrome."

Here in fact is one of the most sensible statements in the debate. When once Viscount Curzon gets away from his obsession that the Navy is capable of running an air force he frequently shows very useful common sense. The whole point about Singapore is that if it is to be what it should be the strategic centre of the future war in the Pacific it must be adequately protected by aircraft. The Navy has shown that it is incapable of visualising the uses of aircraft except as the Fleet Air Arm and that even such a function of aircraft is only partially understood by the naval mind. It is therefore more evident than ever that the security of Western Civilisation in the Far East must depend primarily on the Air Ministry and to quite a considerable extent on the forming of a working agreement with Holland for co-operation between the British and Dutch air forces in the East Indies.

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THE GLOBE-TROTTERS.

As recorded last week Squadron Leader A. S. C. Maclaren, O.B.E., M.C., D.F.C., A.F.C., accompanied by Flying Officer Plenderleith and Serjeant Andrews left the Calshot Air Station at 12.08 hours on Mar. 25 on a Vickers Vulture amphibian flying boat with a Napier Lion engine with the intention of flying round the world.

Shortly before leaving Calshot the following telegram from His Majesty the King arrived for Mr. Maclaren :—

> Buckingham Palace.
>
> "The King desires me to convey to you, Flying Officer Plenderleith and Serjeant Andrews his best wishes for the success of the great enterprise on which you are embarking to-day. His Majesty will follow with deep interest the progress of your flight."
>
> (Signed) Private Secretary.

The Lord Thomson, Secretary of State for Air, came to Calshot to bid the expedition good fortune.

One is informed that The Times newspaper is not actually financing the expedition. It has however acquired the copyright of Mr. Maclaren's report of his progress.

The first day's journey on Mar. 25 ended at Le Havre where the expedition ran into thick fog. According to The Times' report they flew into fog at 12.50 and at 13.15 were flying at 50 feet with nil visibility. At 13.25 cliffs appeared 50 yards ahead and were only missed by the pilot Mr. Plenderleith making an Immelmann turn. The report says that at 13.28 they landed in the sea "all as white as sheets." Thence they taxied along the coast and arrived at Le Havre at 14.50.

One ventures to suggest that it was bad policy to continue flying within what was known to be the danger zone of the French coast with nil visibility. The sea was flat calm so no danger would have been incurred by alighting and the narrow escape of the expedition from annihilation certainly seems to indicate that the risk was not worth taking. It may be very clever to get out of a tight corner but rather more success is achieved by never getting into one. If the expedition had crashed at the start very much harm would have been done to aviation in the estimation of the public. In fact one thinks that The Times newspaper might have done a service to aviation by editing out the story of that narrow escape and especially the "white as sheets" phrase.

Incidentally, The Times' report of the expedition contains one or two curious statements, as for example :—"There was no following wind to increase the route speed; and the sea was flat, whereas a lop on the surface would have helped to throw the machine off the water." This somehow suggests that it is desirable to take a flying boat off the water down wind, which is not as done.

On Mar. 26 the Vulture left Le Havre at 10.53 in rain and followed the Seine Valley. According to Mr. Maclaren they set a compass course towards Lyon but according to to his diary they passed close to the South of Paris and thereafter followed the Paris-Lyon-Mediterranée railway (commonly called the P.L.M.) nearly all the way to Dijon before turning off for Chalons-sur-Saône at which point they were roughly 30 miles off the compass course. Thereafter they followed the P.L.M. main line again over Mâcon and landed at Lyon at 16.40.

WELL OFF :—A photograph by Leonard Bridgman of the Vickers Vulture (Napier Lion engine) actually starting on its voyage.

On Mar. 27 the expedition left Lyon (which The Times insists on spelling Lyons) at 11.00.

The following note by that paper's special correspondent deserves to be recorded :—

> The party left here at 11 o'clock for Rome. An admirable start was made after a run of over 1,000 yards. The Vickers-Vulture was greatly admired here, but the opinion was expressed that it was very heavily loaded and rises with difficulty. On a small aerodrome with obstacles to surmount it is thought that there might be trouble."

The party reached Civita Vecchia, about 40 miles from Rome, at 19.45 hours.

The flight from Lyon down the valley of the Rhone was made in rain and thick cloud but when flying along the Riviera the weather improved. Near San Remo the course was altered for Corsica and Civita Vecchia.

On Mar. 28 the expedition left Civita Vecchia early and unfortunately damaged the port float in getting off. They landed at the Centocelle Aerodrome near Rome at 07.50. Here they were met by General Piccio commanding the Royal Italian Air Force and Signor Finzi the Assistant Commissioner for Aviation. The damaged float and also a damaged tank were repaired by the Italian Air Force.

On Mar. 29 the team were entertained to lunch by Signor Mercanti the Intendent-General for Aviation, and the British and American Ambassadors visited the aerodrome to inspect the machine in the afternoon.

On Mar. 30 the expedition left Rome at 06.25 and landed in the harbour at Brindisi at 10.45 where the machine was got ashore with some difficulty owing to a contrary wind. The journey from Rome to Brindisi was very bad owing to heavy rain and Mr. Maclaren feared that they might not be able to get across the Apennines. He lays considerable stress on the usefulness of the Reid Control Indicator when flying through heavy clouds.

After leaving Brindisi for Athens the machine was brought down owing to engine vibration in Lake Korissia in the Island of Corfu, where Mr. Maclaren had to walk ten miles to find a telephone. Investigation showed that the airscrew gearing had stripped. The machine will remain there till new gearing arrives from England,—it is said by aeroplane.

The mishaps at the start will, one hopes, satisfy the law of averages and assure freedom from trouble in the more difficult stages of the journey.

THE FAREWELL :—Lord Thomson (Air Minister) making his farewell speech to (left to right) Messrs. Andrews, Plenderleith and Maclaren, with Sir Sefton Brancker in the background.

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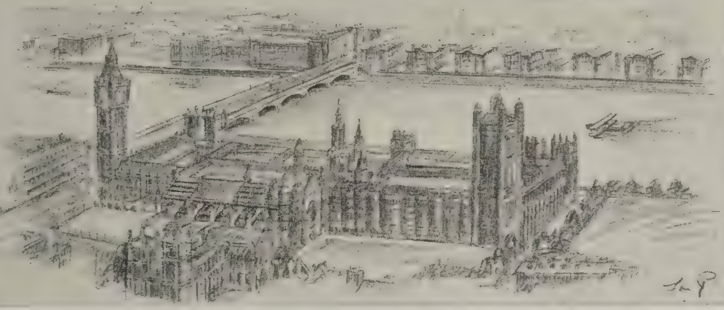

EXHIBITORS IN THE PALACE OF ENGINEERING,
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IMPERIAL AIRSHIP SERVICES.

The Annual General Meeting of the Institution of Aeronautical Engineers held on Mar. 20 was reported so far as concerns the business transacted and the President's address in last week's AEROPLANE.

Following Lt.-Col. Moore-Brabazon's Presidential address, **MR. ASHBOLT**, Agent-General for Tasmania, briefly outlined the case for the development of an Inter-Imperial Airship Service. He pointed out that for long distances the steamship had already reached the economic limit of speed—in fact steamers to Australia to-day were actually slightly slower than they had been 30 years ago, and no appreciable increase in speed could be expected unless the rates for both passengers and goods were greatly increased.

Yet the result of the War had rendered more rapid Imperial communication essential to the prosperty of this country. Before the war, with the whole world as a market, Britain exported not less than one-third of her total manufactures.

Mr. Ashbolt says that a large portion of the world is now unable to buy at British prices, or is definitely attempting to exclude British manufactures. Our productive capacity fully employed is probably double that of 1913, our need of imported food is greater than before the war, and the repayment of our huge debts can only take place by means of exports. The whole of our productive capacity fully employed would not be too much to meet our present obligations, and it is to the British Dominions alone that one can reasonably look for the markets which will absorb these manufactures.

The Dominion markets are being intensely cultivated by foreign interests, and if the British share in Dominion trade is to be maintained let alone increased, British manufacturers must be in closer touch with the buyers in the Dominions. Important as foreign trade is to Britain, the British home trade is nevertheless of still greater importance to the home manufacturer, and with the existing slow methods of transport which alone are available principals of British firms cannot afford the time to give the overseas markets that personal attention which is desirable if they are to be developed to the utmost extent. Equally it is often impossible for Dominion buyers to visit Britain and become aware of what Britain has to offer.

Also the political and commercial stability of the Empire will be in danger unless the British Military Services are in a position to defend the Empire against envious nations that might be tempted to annex portions of our Dominions, and the obvious military value both of rapid communications and of a fleet of airships available for naval reconnaissance must be recognised in this connection. The airship can do the work of several cruisers at a considerably reduced cost, and this has an important bearing on the subject.

Despite recent accidents to lightly constructed airships of war design used for purposes for which they were unsuitable, there is no reason to doubt that strong and sturdy airships suitable for long distance commercial work can now be built which would also serve admirably for naval reconnaissance.

THE DISCUSSION.

COMMANDER F. M. BOOTHBY said that there could not now be any doubt as to the practicability of airship transport, but before it was possible to undertake the operation of a regular commercial service, such as that to India and Australia, a survey ship would have to be operated on the route to investigate the conditions. When the Germans sent an airship to the Sudan during the war they had great trouble with among other things gas-bag fabric and their gas-bags behaved so badly that they had to drop all their cargo in order to get back. Fabrics were now available which promised much better results than those then in use, but tests had to be made in actual service before it was possible to feel satisfied on this point—as on many others.

The mooring-mast was admittedly a most important feature of airship route equipment—it seemed to him well to give the real originator of the idea due credit. The basic idea of the mooring mast should be traced to Admiral Sir Reginald Bacon at the time of the construction of the Mayfly.

The promoters of the Burney scheme claimed to have at their disposal a number of inventions tending to the improvement of airships—particularly in the matter of heavy-oil engines. It would be interesting to have some information on this subject. They did not own rights in the hydrogen-paraffin type of engine, and the only other heavy-oil engine of which he had heard was the Beardmore which was not yet in a condition to fly.

It seemed that an Imperial Airship service was undoubtedly to be encouraged by the Government, but it was not certain what form was to be taken by this encouragement. The Conservative scheme had been to grant a monopoly to a State-aided concern, but personally he thought the better scheme was to provide the bases and auxiliary services and then to encourage competition. The Government scheme for aeroplane services followed the monopoly plan, and to take the alternative in the case of airships would enable the two methods to be compared.

He had been assured by leading authorities in the steamship world that if it could be shown that an airship service could pay even ½% on the capital expended all the leading steamship lines would run their own airships—otherwise they would have to face losing all their mail contracts.

MR. A. P. THURSTON expressed the opinion that the engineer would certainly prove able to overcome all the mechanical and technical difficulties of airship transport when the opportunity was afforded him.

MAJOR O. T. GNOSSPELIUS said that Britain had probably the worst possible climate for aerial transport services in the world. He had some knowledge of the Tropics and weather conditions there were undoubtedly more reliable than in this country. Australia, however, was in a temperate zone—how did the weather there behave? If the risks of delay from bad weather conditions at that end of the line compared to those in this country this would be a serious handicap.

CAPT. SAYERS said that after a small experience of travel in an airship with proper passenger accommodation he believed that nobody who had the opportunity of travelling by airship would ever wish to travel for long distances by any other method.

Air transport however seemed to have developed at an inopportune moment. Looking back over the history of transport it would be found that railways on the whole had not paid—even to-day after writing off huge losses railway dividends were not large. Shipping—if they were to believe what they were told—was an unprofitable business, and London transport was just now disorganised because the London transport services could not afford to pay decent wages. Yet our ancestors had sufficient enterprise to adventure their capital in transport undertakings. Nowadays there did not appear to be enough enterprise to tackle the development of such schemes if there was any doubt about the financial results, and apparently it was necessary to call on the Government to give financial assistance to any work of this kind. Fortunately Governments seemed to have picked up a little of the enterprise which our commercial men had lost in the past century—but the outlook did not favour rapid development of new forms of transport.

COL. A. HACKING (Secretary of the Society of Motor Manufacturers and Traders) said that this question of airship transport was a matter of the first national import. They had to look to the Government in the matter, but they would find that earlier forms of transport had developed in spite of Governments and not because of their assistance. Government assistance in this matter should follow the lines of the motor vehicle subsidy established before the war—that is should take the form of a payment to owners on account of the maintenance of transport facilities that would be available for use in war.

One of the most important matters he thought was that of insurance. At present most life insurance policies were void in cases of aeroplane accidents—mainly because insurance companies had not statistics on which to assess the risk. The Government could very usefully assist in this matter of insurance. Then the Government should establish the necessary bases for air transport.

Given official assistance in these three matters commercial enterprise could look after the operation of the services. But for the Government to take over the operation of an Imperial Air Service would be as bad as if it took over London Transport.

MR. W. O. MANNING said that it was difficult to appreciate nowadays the state of affairs 100 years ago. Edinburgh was then as far from London as New York is now, and it is on record that at that period a French privateer thoroughly sacked six islands on the West Coast of Scotland and reaped a total booty of the value of 1s. 6d The enormous increase in the wealth of Scotland since that time was mainly due to the improvement in transport. To-day, if we could make Australia as accessible as New York by airship transport the wealth not only of Australia but of the whole world could be enormously increased.

MR. ASHBOLT said that the only question to which he had to reply was as to the Australian weather. It might be taken that air services in Australia would not be delayed one day in ten years by fogs. Occasional big gales were the only likely causes of delay, but given proper meteorological services there was no reason why an airship should ever fly through a bad storm—it could go round it. The object of the proposed two years of experimental service was the investigation of weather and climatic conditions and the development of organisation.

ROUND THE WORLD FLIGHT
(U.S. Army Air Service)

All Machines Lubricated Exclusively
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Mobiloil

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It was necessary to select an oil of the highest quality and of the proper body and character to assure the correct lubrication of these machines. It was also necessary that the oil should be available the world over.

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Throughout this flight Gargoyle Mobiloil "B" will be used; the same in every respect as the Gargoyle Mobiloil "B" on sale everywhere. The same high quality and dependability mark the other grades of Gargoyle Mobiloil.

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VACUUM OIL COMPANY, LTD

AN AMERICAN CORPS RECONNAISSANCE SPECIFICATION.

The United States Army Air Service has recently issued specifications for two-seater Corps Observation machines—corresponding to the type known in this country as Corps Reconnaissance machines—and has invited American aircraft manufacturers to submit competitive designs to these specifications. It is proposed to give orders for four sample machines (one of each of the four designs adjudged to be most promising) at prices fixed at $70,000 for the machine adjudged to be best, $60,000 for the second, $50,000 for the third, and $40,000 for the fourth.

This specification is of distinct interest as indicating the performance which the U.S. Air Service believe to be practicably attainable, for the right to reject any sample machine which does not meet the specification as to performance or does not comply approximately with the requirements—even although a provisional order is given on the basis of a projected design—would prevent constructors from entering unless they could see their way to meet with the specification.

Machines may be designed for either the Wright T.3 (575-650 h.p.) the Curtiss D.12 (400-450 h.p.) the Liberty (400 h.p.) or the Packard 1A 1,500 engine. The engine, together with armament and instruments will be provided by the Air Service but must be installed by the contractor.

The machines are to carry a crew of two, fuel for half an hour at ground level and/or three and a-half hours at 15,000 ft. oil equal to 10% of the fuel weight, one fixed synchronised gun, two Lewis guns on ring mounting, 355 lbs. of instruments, electrical and miscellaneous equipment, crashproof petrol tanks—unless tanks are in the wings—and an engine starter. Provision is to be made for extra fuel and oil tanks to give an extra 150 miles cruising range, but these shall not be carried on performance trials.

The landing gear is to be without an axle connecting the two wheels, but retractable undercarriages are not desired.

The pilot's seat is to be adjustable on the ground both vertically and horizontally through a range of at least four inches. The cross-section of fuselage at the aft cockpit is to be 32 inches wide outside and 42 inches from floor to the top of the Scarff gun mount. The upper wing is to be at least 15 inches clear of the fuselage and shall not obscure more than 30° of the pilot's field of view vertically.

The lower wing shall not obstruct the pilot's view above 30° below the horizontal, nor subtend a vertical angle from the pilot's seat of more than 45°. It shall allow the observer to have a clear view up to 30° forward of the vertical.

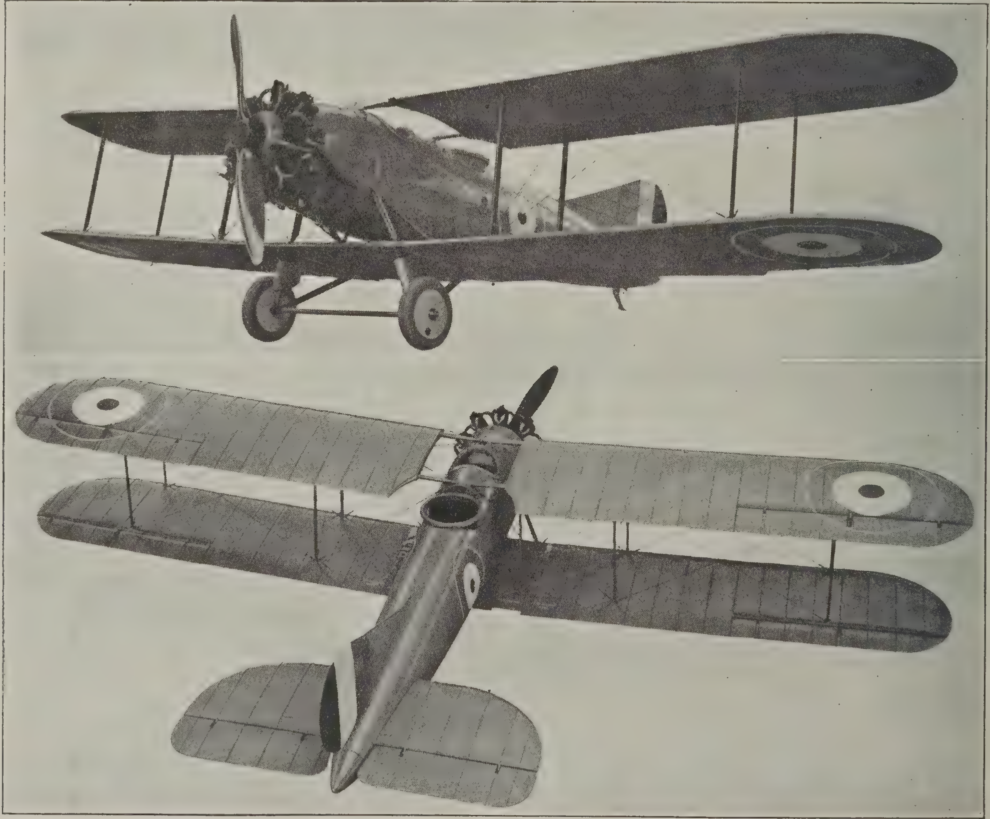
The after guns are to have a field of fire up to at least 30° ahead of the vertical downwards, and the lines of fire from either side shall intersect not more than 150 ft. below the fuselage. The machine is to carry a type K3 Camera, parachutes for the crew and fire extinguisher.

The performance required is a top-speed at ground level of 150 m.p.h., climb to 15,000 ft. in 20 mins., service ceiling 21,000 ft., landing speed of not more than 60 m.p.h. These performances to be made without a supercharger, but the machine is to be designed to allow a supercharger to be fitted with the minimum of modification.

In addition to performance requirements, the specification calls for the following qualities :—A degree of stability which renders the craft a steady gun platform, a high degree of controllability and manœuvrability, ability to land in a small space and to steer at low speed on the ground and to take off in cross-winds on rough surfaces. Finally, ease of maintenance and overhaul both of machine and power plant is called for.

Machines are to be rated by the giving of marks for various qualities. For a performance precisely as specified a total of 35 marks will be awarded. One mark per m.p.h. will be deducted or one added for each m.p.h. below or aboue 150 m.p.h. for each 200 ft. above or below the specified service ceiling, for each minute below or above 20 minutes taken to reach 15,000 ft., and one mark will be added for each 25 miles above and one deducted for each ten miles below an attained cruising radius of 450 miles.

The remaining qualities will be marked by awarding



THE SHORT SPRINGBOK (400 h.p. Bristol Jupiter). The first all-metal aeroplane to have been built for the R.A.F. It is a noteworthy case of a novel development which has occurred in spite of rather than because of official encouragement given to the Aircraft Industry.

TRAVEL

The word appeals to every Englishman and every Englishwoman. The British Empire is the result of the desire for knowledge of lands other than the diminutive island which is called "Home" by every citizen of the Empire.

SAFETY
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The highways of the Sea have been marked out by British ships with the aid of Sail and Steam. The same initiative is now at work in the Air, where

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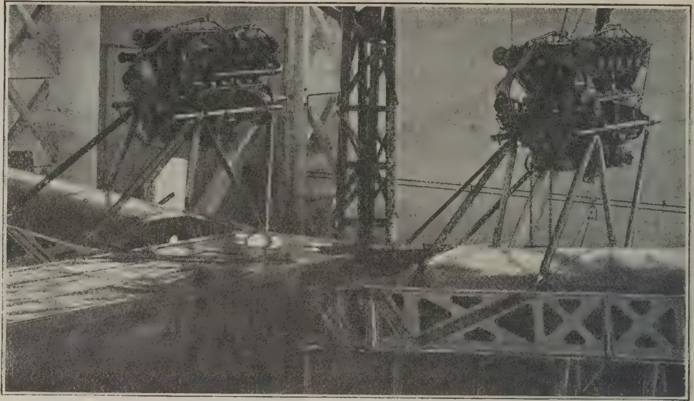


The mounting of the Rolls-Royce Eagle IX engines of the Rohrbach flying boat which was described in "The Aeroplane" of January 2.

The photograph shows in addition to the actual engine mountings some of the detail of construction of the wings, in particular of the rear spar.

This machine constructed by the Rohrbach Metall-Aeroplan A.S. of Copenhagen to the designs of Dr. Rohrbach is built of duralumin, and has been flying very successfully at Copenhagen.

the maximum marks to the best machines in that particular respect and by assessing the others by comparison. The maximum marks for various qualities will be :

Ten marks each for Stability, Manœuvrability and Control, Landing and Taxying, ease of maintainence of (a) Power plant, (b) Machine, Safety of Crew, and the Invulnerability of the cooling system.

Five marks each for Taking off, Field of vision, excellence of Equipment installation, and of Armament installation.

Four marks for arrangement of extra fuel and oil capacity

Three marks for engine-starting arrangements.

Two marks each for excellence of Tail-plane adjustment, Control arrangements, Cockpit arrangement.

The total marks other than those for performance sum up to 115, whereas compliance with the specified performance gives only 30 marks. It is announced that any machine which does not exceed 145 m.p.h. top speed, has a service ceiling less than 19,000 ft, takes more than 25 mins to reach 15,000 ft., or has a cruising range of less than 450 miles, will have very small chance of acceptance.

THE LOSS OF THE DIXMUDE.

The disappearance of the Zeppelin L72, christened Dixmude by the French—on or about Dec. 20 1923—has not yet been publicly explained and possibly never will be. It will be remembered that after a long voyage from Toulon over the Mediterranean and the Sahara, the Dixmude disappeared during a period of extremely stormy weather. Various reports of a confusing nature as to the ship having been sighted at places almost impossibly far apart were current, and after a few days, the body of the ship's commander, Lt. du Plessis de Grenadan, and the wreckage of one of the ship's nacelles, was discovered near the coast of Sicily.

The wreck of the main structure of the ship has not yet been discovered, but from the condition of the parts found the ship appears to have caught fire. From this it has generally been concluded that the ship was struck by lightning.

The French Government have not thought fit to publish any account of the wireless messages which were received from the Dixmude during this voyage, and it is of course possible that when she encountered the very severe storm in which she came to her end the aerial was withdrawn as a precaution against lightning Under the circumstances the precise cause of the disaster must obviously remain conjectural, but the opinions of those who are qualified to judge as to the possible causes of the accident are valuable.

Dr. Hugo Eckener, of Friedrichshafen, in an article in Luftfahrt for January, and in a letter of somewhat later date, expresses the opinion that it is not by any means established that the Dixmude was burnt. For had the ship come to this end, the whole skeleton of the ship should have been found in the same neighbourhood as the part of the nacelle and the Commander's body. If the ship actually burnt, then he admits the probability that the fire was caused by lightning, rather than that the ship was broken up by the storm and caught fire after breaking—as did R.38. For although it is admitted that L72 was very lightly built, structural failure was very unlikely to occur except as the result of violent manœuvring.

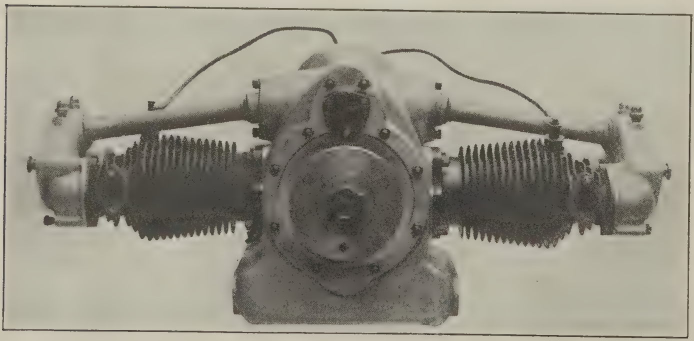
At the same time even if this did occur the accident is not to be traced merely to the fact that the ship was struck by lightning. A metal-framed airship travelling between oppositely charged thunder clouds will be extremely likely to be struck by lightning but no evil should result. [In fact it is on record that parts of the girder-work of a Zeppelin have been fused by lightning without the ship catching fire.—Ed.] The really grave danger of lightning arises only when the ship is blowing off hydrogen as in that case lightning may ignite the issuing gas.

The commander of the Dixmude was known as a capable pilot and it is unlikely that he should have been ignorant of this fact, and therefore, if the Dixmude were set on fire by lightning in this way, the cause is probably to be found in her going out of control—as from failure of certain of her engines—and thus making it impossible for the pilot to hold her down to a height at which the gas pressure did not exceed the atmospheric pressure. If the ship rose above this pressure-equilibrium height she would inevitably blow off gas and lightning could then ignite the escaping hydrogen.

Dr. Eckener however believes that the ship did not catch fire, but that in the first place some of the engines failed and it consequently became necessary to lighten her by dropping ballast. The ship then rose above the pressure-equilibrium height, lost gas, became heavily loaded by rain and finally could not be kept above the sea. On striking the water the front nacelle was carried away, and lightened by this the ship rose again—to fall into the sea again after an hour or two, where she would break up and sink.

Another Light Aeroplane Prize.

The Royal Aero Club announces that the Society of Motor Manufacturers and Traders have presented a prize of £150 to be awarded for the longest distance flown during the forthcoming Light Aeroplane Competitions.



A NEW LIGHT AEROPLANE ENGINE.—The Coventry Victor 'Plane engine, described as 10/38 h.p., and presumably of round about 1,000 c.c. cylinder capacity which has been specially designed for light aeroplanes.

The makers state that the overall dimensions are 34 inches over valve gear, 15 inches deep and 15¼ inches high. The weight is given as 105 lbs. No other data is available.

Smith's Instruments and K.L.G. Plugs again selected for WORLD FLIGHT.

THE Vickers Vulture (450 h.p. Napier Lion) piloted by Flying Officer Plenderleith and navigated by Major MacLaren on his attempted Round the World Flight, is fully equipped with Smith's Instruments and K.L.G. Plugs.

IT is a remarkable fact and worthy of note that whenever a pioneer flight is attempted, Smith's Instruments and K.L.G. Plugs are invariably chosen. Because of their unfailing accuracy and reliability under the most exacting conditions, the Smith equipment is fitted by the leading Aircraft Manufacturers of the World. They have unanimously decided that no other equipment is just as good.

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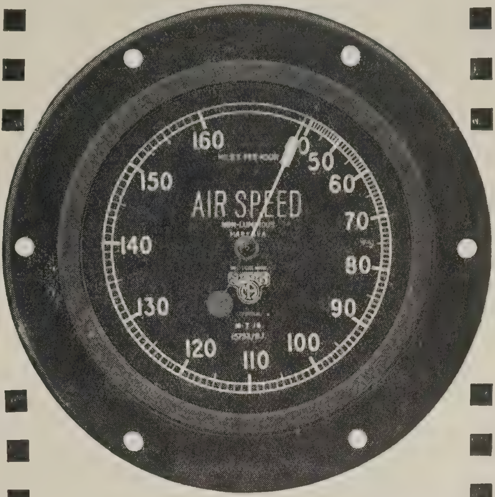

Previous Notable Achievements.

Smith Aviation Instruments and K.L.G. Plugs were fitted to machines used in the following historic events:—

Alcock-Brown Atlantic Flight.
Hawker-Greave Atlantic Attempt.
Ross-Smith Flight to Australia.
Double Flight of the R.34 across the Atlantic.
Cairo to Cape pioneer Flight.
First London to Madrid non-stop flight.
British Speed Record of 212 miles per hour, 1922.
Every machine in every Aerial Derby for the last 5 years.
Every competitor in the Light 'Plane Competition, 1923.

No other firm in the World has such a record.

Buy Smith's British Aviation Instruments.

THE ROYAL AIR FORCE.

London Gazette.

Mar. 25.

Air Commodore C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., is appointed Director of Personal Services, Air Ministry (Mar. 5).

General Duties Branch.—The follg. are granted permanent commns. in the ranks stated (Mar. 26):—Sq. Ldr. S. R. Watkins, A.F.C.; Flt. Lt. H. H. Down, A.F.C

The follg. are granted S.S. commns.:—Flg. Offs. (for Seven Years on the Active List): R. F. Carter (Lt., R.N., retd.), A. L. R. Duke (Capt., Indian Army, retd.), W. F. Humphrey (Lt., R.N., retd.), M. E. B. P. Storrie (Lt., R.N., retd.), G. N. P. Stringer (Lt., R.A.R.O.) (Mar. 15).

Plt. Off. on Probation (for Five Years on the Active List): B. O. Babb, V. B. Bingham-Hall, M.C., H. E. N. Burton, J. M. Cohn, F. H. S David, C. Feather, E. A. H. Fisher, R. A. Ford, A. N. Francomber, V G. H. Gee, M. W. Goldie, C. E. Hillier, L. M. Johnston, W. J. Lewis, H. R. Lowry, H F. Luxmoore, A. L. Macmillan, A. W. B. McDonald, A. D. McDowall, A W G. Martin, H. S. Martin, W. V. R. Nicholl, H. M. G. Parker, D. K. Power, G B. M. Rhind, C. D. Shearing, E. L. Shepherd, C. S. Staniland, H. W. P. Stewart, N. A. West (Mar. 15); R. R. Bennett (Mar. 21).

The follg. Pilot Officers are promoted to rank of Flying Officers (Feb. 16):—D. Macfayden, N. Vintcent, D.F.C.

Stores Branch.—Flt. Lt. E. N. R. Waldron is granted a permanent commn. for accountant duties (Mar. 26). Sq. Ldr. H. E. J. Hewitt is transferred to the Stores Branch from the General Duties Branch, with effect from, and with seny. of, May. 1, 1923.

Medical Branch.—Flt. Lt. E. G. S. Hall, M.B., resigns his S.S. commn. (Mar. 11); Flt. Lt. (Hon. Sq. Ldr.) A. E. F. F. Huntsman relinquishes his temp. commn. on account of ill-health, and is granted the rank of Sq. Ldr. (Feb. 8).

Reserve of Air Force Officers.—The follg. officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs.: J L. S. Gill, A.F.C. (Mar. 2); J. M. Leach (Mar. 5).

Appointments.

Week ending Mar. 31.

General Duties Branch.—Wing Commanders C. L. Courtney, C.B.E., D.S.O., to H.Q., India, whilst attending course at Staff College, Quetta, 1/3; A. C. Winter, O.B.E., to Egyptian Group H.Q., for temporary duty; A. Corbett-Wilson, to H.Q., Egypt, for Technical Staff duties, 10/3; A. D. Cunningham, C.B.E., to R.A.F. Depot pending disposal on transfer to Home Estab., 17/2; H. le M. Brock, D.S.O., to Air Ministry for Air Staff (Training) duties, 7/5; B. E. Smythies, D.F.C., to Air Ministry for Air Staff (Operations) duties, 1/4.

Squadron Leaders C W. Nutting, O.B.E., D.S.C., to Air Ministry, 1/4; C. J. Mackay, M.C., D.F.C., to R.A.F. Depot, 1/4; G. S. M. Insall, V.C., M.C., to R.A.F. Depot pending disposal, 1/4; F. E. Hellyer, O.B.E., to R.A.F. Depot, on transfer to Home Estab., 3/3; R. C. Hardstaff, to Arm. and Gunnery School, Eastchurch, on transfer to Home Estab., 1/4; A. H. Measures, O.B.E., to Engine Repair Depot, Egypt, 10/3; D. Harries, A.F.C., to No. 4 F.T.S., Egypt, 16/2; A Coningham, D.S.O., M.C., D.F.C., to Egyptian Group, H.Q., 23/2; R. T. Leather, A.F.C., to H.Q., India, 1/3.

Flight Lieutenants A. P V. Daly, to No. 99 Sqdn., Netheravon, 4/4; T. W. Elmhirst, A.F.C., to R.A.F. Depot on transfer to Home Estab., 8/3; T. Le G. Pynches, to Aeroplane and Arm. Exper. Estab., Martlesham Heath, 27/3; A. P. Maurice, D.F.C., to No. 17 Sqdn., Hawkinge, 1/4; A. L. Chick, A.F.C., to R.A.F. Depot on transfer to Home Estab., 16/2.

Flying Officers J. Bowen, to Basrah Group H.Q., instead of to H.Q., Iraq, 18/1; D. C. Prance, to No. 3 Sqdn., Manston, 1/4; A. R. Prendergast, to R.A.F. Base, Leuchars, 1/4; A. H. C. Derby, to No. 7 Sqdn., Bircham Newton, 28/3; E. R. Maddox, M.C., to R.A.F. Depot on appointment to a S.S. Commn., 25/3; H. A. Boniface and E. F. Colam, to remain at Aircraft Depot, India; E. C. Ridlington, to Trans-Jordania H.Q., 10/3.

Pilot Officers G. H. Rawlinson and A. S. Hutton, to remain at Aircraft Depot, India; S. A Young, to No. 17 Sqdn., Hawkinge, 1/4; F. E. Watts, to No. 24 Sqdn., Kenley, on appointment to a Perm. Commn., 24/3; R. R. Bennett, to No. 5 F.T.S., Shotwick, on appointment to a S.S. Commn. for course of instruction, 21/3.

Medical Branch.—Flight Lieutenants (Medical) T. J. Thomas, M.B., to Basrah Combined Hospital, Iraq, 19/2; J. C. Osburne, M.B., to H.Q., Iraq, 14/3; E. G. Howell, to H.Q., Egypt, 15/3. Flying Officer (Medical) F. K. Wilson, M.B., to H.Q., Iraq, 14/3.

Store and Accountant Branch.—Flight Lieutenants (Stores) A. W. Turner, to R.A.F. Depot (Non-effective Pool), 1/4; D. Barron, to H.Q., Coastal Area, 27/3; N. Robertson, to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab., 28/2. Flight Lieutenant (Accountant) P. J. Farmer, to R.A.F. Base, Gosport, 14/1. Flying Officer (Stores) M. R. Preece, to No. 100 Sqdn., Spittlegate, 1/4; A. T. Shaw, to Air Ministry, 1/4. Flying Officer (Accountant) J. Baines, to School of Naval Co-operation, Lee-on-Solent, 17/4; S. C. Gibbs, to No. 4 Sqdn., S. Farnborough, 8/4; R. W. Leamon, to R.A.F. Base, Leuchars, 23/4. Pilot Officer (Accountant) F. C. Warner, to R.A.F. Depot, 21/3.

The Air Ministry Surplus.

It was stated in the daily press on Apr. 1 that a Treasury Minute issued on Mar. 31 authorises the temporary application of surpluses on certain Air Votes for the year 1923-24 to meet excesses on other votes for the same year.

There is a sum of £330,000 required for technical and warlike stores due to expenditure on the expansion of the home defence programme, to increased demands for aircraft equipment by India, and to miscellaneous causes. There are also balances irrecoverable, amounting to £10,000. The total saving on the Air Votes amount to £1,527,000, leaving a net surplus of £1,184,000.

The R.38 Memorial.

A memorial to the crew of the R.38 which broke over the Humber on Aug. 24 1921 will be unveiled on Apr. 11 in the Hull Western Cemetery where many of those involved in the disaster were buried.

Rugby Football.

(*Unofficial.*)

Leicester v. R.A.F.—The R.A.F. were beaten at Leicester by two goals to three tries. The following account of the game is extracted from the *Morning Post* with due acknowledgements. The Leicester forwards were led by Mr. W. W. Wakefield, formerly Captain of the R.A.F. team.

Leicester were by no means four points better than their opponents, who played so well that they could consider themselves unlucky to lose. Leicester indeed had really to thank the dominating personality of Wakefield and the accurate goal kicking of Day. Wakefield was in great form in a pack beaten for pace and strength, and in the first half scored two wonderful tries himself.

The Air Force forwards scrummaged splendidly, and brought off some magnificent rushes, which put the Leicester defence to a severe test, and with a little more certainty among the backs the visitors would most probably have achieved a striking success. One round of clever passing led to Bryson going over with a fine try, and in the second half the Air Force repeatedly attacked. Bryson narrowly missed dropping a goal, and then enjoyed the satisfaction of scoring another try.

The R.A.F. team were: J. G Stephens; C. B. Riddle, O. C. Bryson, P. F. Chambers, and P. G. Scott; F. C. Russell, and C. E. Medhurst; R. Usher, J. Chick, C. Adams, Cpl. Johnson, E. Wackett, F. Chester, H. Vernon, and S. Collier.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 16; Tuesday, 0; Wednesday, 0; Thursday, 9; Friday, 10; Saturday, 12; Sunday, 11.

London—Paris—Zurich:
Handley Page Transport, Ltd., machines 5, passengers 39, freight nil.
London—Ostend—Cologne:
Instone Air Line, Ltd., machines 5, passengers 28, freight 12,840 lbs.
Manchester—London—Rotterdam—Amsterdam—Hanover—Berlin:
Daimler Airway, machines 26, passengers 8.
Paris—London:
Air Union, machines 12, passengers 41; freight 9,871 lbs.
London—Rotterdam:
K.L.M., machines 10, passengers 18.
Special Machines: 0.

Total number of trips by British machines: 36, carrying 75 pas. Foreign machines: 22, carrying 59 passengers.

Comparative Figures:
For week ending Mar. 30:
Machines, 58; Passengers, 134; Crews, 100; Total personnel, 234.
Corresponding week, 1923:
Machines, 85; Passengers, 371; Crews, 156; Total personnel, 527.
Corresponding week, 1922:
Machines, 66; Passengers, 177; Crews, 105; Total personnel, 282.
Corresponding week, 1921:
Machines, 48; Passengers 162; Crews, 60; Total personnel, 222.

Croydon Notes.

Bad weather has marked the last week of the old firms and Tuesday and Wednesday were blank days. This weather also accounted for a slump in the passenger figure. The unrest which has characterised the merging of the old firms is discussed elsewhere.

On Monday of this week the Instone Air Line Ltd. gave a swan-song lunch at the Trust House to the pilots and staff of the Line. Sir Samuel Instone, who was greeted with cheers, paid deserved tribute to the pilots, mechanics and staff of the Line. He reviewed their history and pointed out with justifiable pride some of the final achievements. He said, with obvious regret, that it had now been decided that it was best for the future of aviation to have only one company and so the Instone Line would cease to exist as a separate entity. He mentioned especially Lt.-Col Bristow, Ogilvie and Partners Ltd., Major Greer and Mr. Eskell who had been responsible for the success of the Line. He also said that Mr. Barnard, the firm's first pilot, had flown a distance equal to twelve times round the Equator.

Major Greer said that he was convinced that the status of pilots was bound to rise rather than fall as longer routes were operated and bigger and faster aircraft became available, with which statement one cordially agrees. [On the assumption that some day the present pilots will be captains of big ships with mere helmsmen at the controls.—Ed.]

The lunch concluded with certain presentations and Sir Samuel announced that the directors had voted five hundred guineas for division among the staff of the Instone Line.

Over at the Aircraft Disposal Company Mr. Perry tested a Bristol Fighter on Thursday and on Friday made two flights on similar machines.

A number of well-known personalities at Croydon are not likely to appear among the personnel of Imperial Airways Ltd.—some of them because they do not agree with the policy of the I.A. Ltd. Directorate and others for lack of space.

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160 H.P. BEARDMORE.
AVRO TYPE 504K.
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SOPWITH "SNIPE".
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A Movement in Australia.

The *Morning Post* correspondent at Sydney, N.S.W., cabling on Mar 31 says :—

> The Australian Air Force is preparing a seaplane flight around Australia within the next six months with the object of making a reconnaissance of suitable seaplane bases and in order to obtain information regarding flying conditions all round the coast. The flight will be as long as the late Sir Ross Smith's total flight, since the coast perimeter of the Commonwealth measures 12,000 miles.

This is particularly interesting in view of the opinions expressed in The Aeroplane on Mar. 26. It would seem to indicate that the Australian Government is not quite blind to the value of Air Defence against invasion by sea.

An Important Lecture.

Colonel the Master of Sempill will lecture to-morrow Thursday, Apr. 3, at 5.30, before the Royal Aeronautical Society at the Royal Society of Arts, John Street, Adelphi (next door to "The Little Review Starts at 9 O'Clock") on "The British Aviation Mission to the Imperial Japanese Navy."

This lecture should appeal particularly to all those who are interested in the prospects of the next war, for few people know as much about the Japanese Naval Air Service as does Colonel Sempill. Naturally he will not discuss that side of the subject but much valuable knowledge may be gained from his discourse.

The U.S. Army World Flight.

The four Douglas World Cruisers which are engaged in the U.S. Army's attempt to fly round the World are now at Seattle where they are being fitted with floats and generally tuned up. The flight from Los Angeles to Seattle was in the nature of a test flight and any little adjustments which were found to be necessary were made before the machines left American territory. They are due to leave Seattle to-morrow, Thursday.

PERSONAL NOTICES.

Marriage.

BARRETT—HEXTALL.—On Mar. 25, at St. Mary Abbot's, Kensington, James Burney Barrett, R.A.F., youngest son of Mr. and Mrs. Arthur Barrett, to Joan Margaret Hextall, youngest daughter of Mr. H. H. Hextall, of 24, Coltesmore Gardens, W.8.

Birth.

ROE.—On Mar. 27, to Dr. Marie Stopes (wife of H. V. Roe—late R.A.F.) of Givons Grove, Leatherhead, Surrey—a son.

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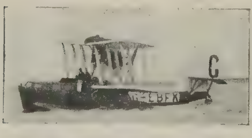

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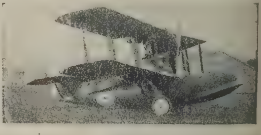

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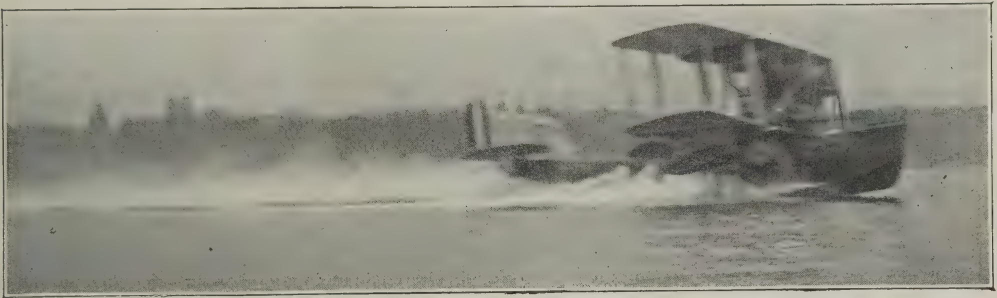

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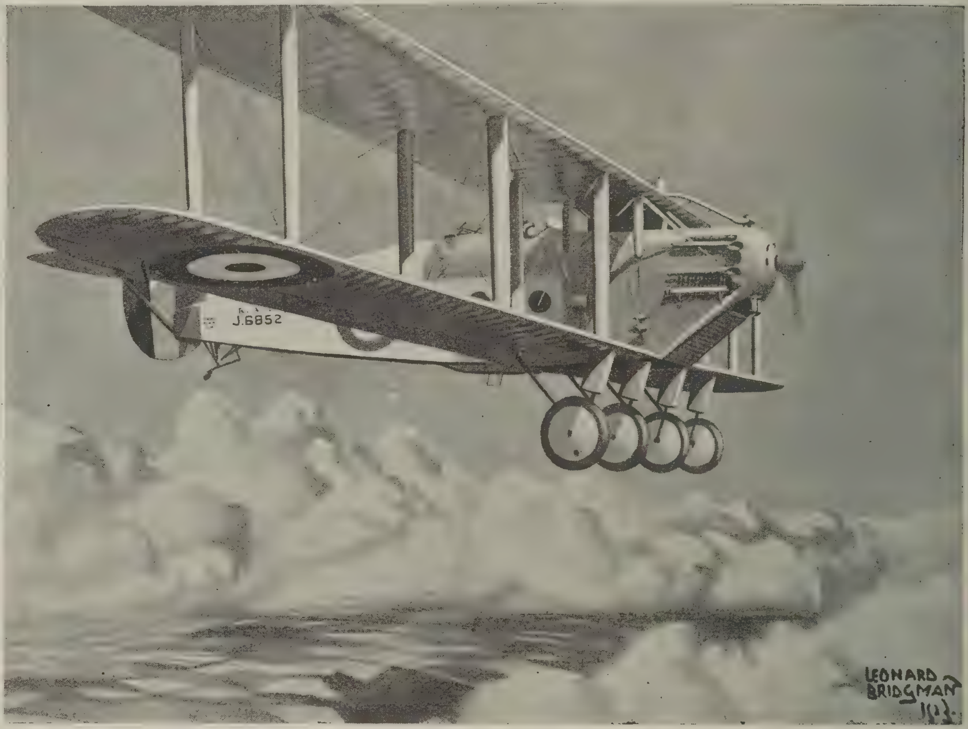

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ON AIRCRAFT AND THE BRITISH EMPIRE EXHIBITION.

Although there is to be no aircraft section as such at the British Empire Exhibition at Wembley aircraft will be represented, albeit in a somewhat irregular way. The only exhibit devoted entirely to aeronautics is that of the Royal Air Force. This will consist chiefly of models of the various types of aeroplanes which are used by the R.A.F. It will therefore partake rather of the nature of a museum of antiquities, seeing that no machines at present in use are of much later design than 1917, with the exception of a few (such as the Fairey Flycatcher and Fawn and the Blackburn torpedo machines) which have been produced for the Fleet Air Arm. It is to be hoped that the organisers of this exhibit will emphasise particularly the fact that the whole energy of the Supply Department of the Air Ministry has been concentrated for the last five years on producing aircraft for the Navy.

The Society of British Aircraft Constructors states specifically that it is not concerned as a society with any of the exhibits at Wembley. The decision not to participate in the exhibition is probably a wise one as an exhibition of modern aircraft would have meant that each firm in the Trade would have to go to the expense of immobilising for several months several thousands of pounds' worth of stock. The only way in which such an exhibit could have been arranged would have been for the Air Ministry to have ordered an extra machine from each firm and to have lent that machine to the firm for the period of the Exhibition, each machine to be taken over by the Air Force at the close of the Exhibition. If that had been done possibly the S.B.A.C. collectively might have raised the necessary money for the actual cost and maintenance of a joint stand as at Gothenberg.

It is understood that D. Napier and Son Ltd. will show a Lion engine on their own stand in the automobile section and that Rolls-Royce Ltd. will show a Condor among their cars. It is also stated that Bristol aeroplanes will be shown. They will presumably appear in the General Engineering section, unless of course the R.A.F. exhibits full-sized specimens in pious memory of the first formation of Bristol Fighters which stayed over the German Lines on Good Friday 1917, almost exactly seven years before the opening of the Exhibition.

But it does seem a pity that British Aviation should not be adequately represented at what promises (or threatens) to be World's Greatest Show.—C. G. G.

ON THE LONDON AERODROME PROBLEM.

Considering that the whole map in the vicinity of London is spotted with aerodromes, used and disused, it may seem strange that there should at this date be any difficulty in finding adequate aerodrome accommodation, especially for such an occasion as the British Empire Exhibition at Wembley. Such however appears to be the situation.

There was a proposition that a fairly adequate area of land close alongside the Exhibition at Wembley should be made into an aerodrome both for joy-riding and as an air station to the Exhibition. This however was not available for various reasons which must be discussed in a separate article. This aerodrome could at best only have been an air station and was not suitable for big competitions. And it is evident that the enormous number of visitors who will come to London during the Exhibition makes it essential that something should be done to attract their attention to serious flying.

The Committee of the Royal Aero Club has stated that it is hoped to organise a big race meeting near London this Summer. The obvious place for a really important meeting in connection with the Wembley show is the Hendon aerodrome, where practically all the classic meetings have been held in the past. It has now become known that the Hendon aerodrome is at present in the possession of the British Government because the Grahame-White Aviation Co. Ltd, who are the proprietors of the Hendon aerodrome had in the course of their war work mortgaged the aerodrome to the Treasury and the Treasury has now forclosed. The Air Ministry has, it appears, now arranged that in due course it will take over the London Aerodrome as one of the Home Defence stations and so it will not at any rate continue to exist as an aerodrome, which is some consolation for those who have tender recollections of the early days of flying.

It is just possible that under these circumstances the Royal Aero Club might be able to hire the aerodrome from the Treasury for a one-day meeting. But if the Treasury had sufficient foresight it would be very much better for everybody concerned, including the British taxpayer, if pending organising the aerodrome it were made available free of cost during the period of the British Empire Exhibition for all aircraft of all nations.

There are in fact several other aerodromes more or less in the same area which could be available for joy-riding or the exhibition of new-type machines to foreign visitors, though they are not suitable for big competitions. It might be possible to revive the Kingsbury aerodrome which is probably the nearest of all to Wembley. There is the Handley Page aerodrome at Cricklewood, which is also quite good for demonstration purposes. And there is the De Havilland aerodrome at Stag Lane, which is perhaps the easiest though not the closest to reach of all the aerodromes in that district. If firms outside London want to have demonstration machines in use during the Exhibition they would certainly do well to endeavour to make some sort of an arrangement with the De Havilland Company for the use of Stag Lane.

There is also another aerodrome just about the same distance from Wembley on the other side and that is the ground at Acton which used to be run by the Alliance Aircraft Company, now in abeyance, the moving spirt of which is the Lord Waring who is generally understood to have obtained his title in connection with aviation. This ground is small for the largest modern aeroplanes but it is quite a usable ground and it is easily reached by electric railway and by road.

In any case it is quite time that something definite was done by the Aircraft Industry, either as a whole through the S.B.A.C. or by individual firms, to arrange matters so that visitors to London who are interested in aircraft may have an opportunity of gratifying their curiosity. A regular advertising campaign should be started as soon as the show at Wembley opens to attract visitors to aerodromes at which modern aircraft can be seen.

No doubt some sort of an arrangement could be made with the Air Ministry under which placards could be shown on the R.A.F. exhibit indicating to visitors where to see aircraft actually operated. Also if the Industry is wise it will produce a map of London showing how people can reach the various aerodromes at which the demonstration machines are to be seen and will arrange to have that map displayed at the various hotels (at least a hundred of them) at which visitors will be staying this Summer. One feels sure that hotel proprietors will be quite pleased to exhibit such a map for nothing in the interests of aviation if the proposal is put to them in the proper way.

So far as one can gather no collective or individual efforts have so far been made towards popularising aviation this Summer or in the direction of stirring up an interest in air defence and air transport among visitors. Therefore one hopes that some of the foregoing hints on the subject will be useful to the Trade.—C. G. G.

COL. F. K. MACCLEAN'S AWARD.

At the Annual General Meeting of the Royal Aero Club which was held at 3 Clifford Street on Mar. 31 the Gold Medal of the Club was present to Lt.-Col. Frank MacClean for his signal services to Aviation. Other recipients of the medal include other such great pioneers as the Wright Bros., M. Blériot, M. Latham and Mr. Cody.

Frank MacClean has since the early days acted as the Godfather of British Aviation. He presented the Eastchurch Aerodrome to the Aero Club. Perhaps strictly speaking that rather overrates his generosity for he sold it to them for the huge sum of one shilling. He provided the Short biplanes on which the first Naval officers learned to fly and he himself made many notable flights as a pilot.

During the war he served in the R.N.A.S. and R.A.F. and last year was made Chairman of the Royal Aero Club. He is an enthusiastic official at all functions of the Royal Aero Club.

UNCIVIL AVIATION.

By C. G. GREY.

It would appear that the most prominent characteristic of Civil Aviation during the past week or two has been its lack of civility. It is alleged that the controlling powers of Imperial Airways Ltd. have been distinctly uncivil to the pilots of the three extinct air lines and it is certain that the pilots have been very uncivil to their prospective employers. Hereafter one has endeavoured to give a fair review of the situation, beginning with an historical account of the dispute and following that with a dissertation on the merits of the case and on the proper solution of the problems involved.

The argument between the two sides has been miscalled a strike. As a matter of fact it is not a strike at all for the very good and sufficient reason that a strike connotes a cessation of work by employees. And it is just as well to point out that the agitating and agitated pilots were never employed by Imperial Airways Ltd. Their engagements with the three original Air Lines, Handley Page Transport Ltd., the Instone Air Line Ltd., and Daimler Hire Ltd., terminated automatically on Mar. 31. None of them has ever been engaged by Imperial Airways Ltd. and therefore they cannot be on strike.

Necessarily in order to fulfil its functions Imperial Airways Ltd. must have pilots, and obviously the most desirable pilots for the moment are those who have already had experience of air line work. It would appear that an entirely unofficial offer of engagement, which might better be described as inquiry as to their ideas on the subject, was made to these pilots on terms which some of them were willing to accept though others were not. These terms offered a comparatively small retaining fee and a high mileage fee which under reasonable conditions of weather and of technical equipment would have enabled the pilots to earn at least as much as they have been earning in the past and possibly more.

Later in order to meet the wishes of the pilots they were offered, still unofficially, a bigger retaining fee and a smaller mileage fee which would enable them to earn much about the same amount though they would be less dependent on extraneous conditions.

Roughly the junior and less experienced pilots would be able to earn about £700 per annum and the senior and more skilled pilots about £850 per annum. Such pay appears to be quite reasonable for men whose responsibility is limited to ensuring their own safety and that of perhaps a dozen passengers.

Therefore so far as one can gather there has been no dispute on the subject of wages since the first discussion between the present Management of the I. A. Ltd. and the pilots. The underlying cause of the argument seems to go a good deal deeper in that it appears to be a deliberately worked-up or faked agitation based essentially on personalities.

The Process of Agitation.

On Apr. 1 a deputation from a body which has chosen the title of the British Aircraft Workers' Union was introduced to Lord Thomson, Secretary of State for Air, by Mr. Ben Tillett. Among the deputation, according to newspaper reports, were Lieut.-Col. G. L. P. Henderson M.C., who was described as the President of the Federation of Pilots, and Capt. F. L. Barnard, formerly of the Instone Air Line, described as Secretary of the said Federation, and they had with them in what was said to be an advisory capacity Mr. Robert Williams of the Transport Workers' Union.

After they had left the Ministry Sir Eric Geddes, Chairman of Imperial Airways Ltd., and Colonel Searle, Managing Director of the firm, also saw the Air Minister. The Air Ministry itself apparently holds an attitude of benevolent neutrality towards both sides and would very much like to bring about a peaceful settlement. No doubt the Government's wishes will be indicated in due course to the Board of Imperial Airways Ltd. by the two Directors appointed by the Air Ministry.

According to the daily press, after the interview at the Air Ministry the pilots issued a statement in which they said :—

> It is strongly felt that the company have deliberately engineered this position in order to compel pilots to treat as to their terms of pay as a body of men without employment.

There was apparently some further argument on the subject of payment by mileage instead of time in the air and finally the pilots claimed that they had been very badly treated for the following reasons :—

> (*a*) the lateness at which the negotiations had been opened, (*b*) the formulation of such a completely inadequate scale of pay, and (*c*) the extraordinarily hostile manner in which their representations had been met, including the application to the Royal Air Force for a body of men to take their places.

The Counterblast.

Apparently by way of counterblast Imperial Airways Ltd. issued on Apr. 1 the following statement :—

> To-day (Tuesday) at the London Terminal Aerodrome, Croydon, Imperial Airways, Limited, the new national aeroplane-operating company, which has a directorate representative of British banking, commerce, transport, and aeronautics (official and commercial), assumed control of the organisation and equipment of the companies it now absorbs. This previously existing organisation, consisting of several separate staffs, will, during the short cessation of flying which has been found essential, be brought together in one centralised organisation, while each passenger aeroplane and cargo machine as at present on service, is to be reconditioned and subjected to tests, in order that it may obtain a new certificate of airworthiness from the Air Ministry. Some of the machines, after undergoing this process, will, it is expected, be ready for service again within a few days.
>
> During the time the previous operating systems are being unified it is proposed to conduct services for freight-carriage only. When the new organisation is functioning smoothly, passenger services will be resumed between London and Paris, Brussels, Amsterdam, Cologne, and Berlin; also between Southampton and the Channel Islands.
>
> The company is now prepared to receive applications from pilots for appointments at the rates of remuneration agreed by the directors, viz. :—

Year.	Salary.	Flying Pay.	Total income if flying an average of 2 hours a day at 85 miles an hr.
1st ...	£400	1⅜d. a mile.	£755
2nd ...	£425	1⅜d. a mile.	£780
3rd ...	£450	1⅜d. a mile.	£805
4th ...	£475	1⅜d. a mile.	£830
5th ...	£500	1⅜d. a mile.	£855

In an interview with a representative of the Times on Apr. 2 Colonel Searle said :—

> In all the correspondence I have had with the pilots the only point at issue has been a question of salary, and no reference is made therein to flying conditions. Therefore, I am entitled to assume that the main question is one of salary, and the only comment they make on my attitude is to thank me in writing for my generous attitude adopted during the meetings with them.
>
> My original offer of £100 a year, in other words, a low retaining fee and generous flying pay, was the basis on which the Daimler pilots have operated, and under which they have earned bigger salaries than any other pilots employed. The first time it was represented to me that the pilots would prefer to have a larger definite salary I immediately agreed, and the offer which was finally made in the company's statement was sent to each pilot in writing.
>
> No answer was received to those letters, but on Sunday I received a letter from the Federation stating that they would consider no other terms than those contained in their previous letter. These are £500 a year as a retainer for pilots in the old companies and £400 a year for any new pilots engaged, plus 10s, a flying hour; £25 increase in the retainer after 500 hours' flying; a contract for 12 months; and £1,000 insurance for death and benefits.
>
> In dealing with this matter I naturally have to consider very carefully both sides of the question, the pilots' interests and those of the company. It is absurd to think for a moment that the board would permit any arrangements to be made which would force pilots to fly under conditions which were dangerous either to themselves or the public. I have never heard of a case in which a pilot has been forced to go into the air against his better judgment, and I can assure any pilots who will be employed by the company that they will not be forced to go into the air against their will under any circumstances.
>
> With regard to the mechanics, they are asking for approximately 30 per cent. above trade union rates of wages. So far as I am concerned, so long as the terms put forward are reasonable, I am perfectly prepared to meet them.

The Pilots' Pleas.

Against the schedule of pay already quoted the pilots, again as reported in the daily press, have said that Handley Page pilots were receiving £915 per annum, Instone pilots £857 and Daimler pilots were earning on an average £1,000 a year. Consequently according to the pilots it is not correct to say that the terms offered by the new company are as good as those which have prevailed hitherto.

Further in another manifesto which appeared in the newspapers on Apr. 3 the pilots, evidently endeavouring to enlist public sympathy, said :—

> The public may be inclined to think that the terms of pay offered by the new company sound quite reasonable for what is admittedly not more than a few hours' work per day. When, however, there is taken into consideration all the experience, knowledge, and skill required, not to mention the risk and comparatively short flying life, the pay seems distinctly on the low side, and it is certainly a fact that the terms advertised in the Press to-day are definitely well below those that have hitherto prevailed.
>
> It must not be forgotten that a pilot is called upon to display skill and knowledge in all the above departments simultaneously. In the cockpit he may have twenty instruments, requiring constant watchfulness in order that any signs of failure in the apparatus may be detected, and at the same time he must be constantly looking round in order to be sure of a suitable field if a forced landing should be necessary. At the same time he will be tuning his wireless and talking with various aerodromes as to weather conditions, weather forecasts, the position of other machines, etc.
>
> He will probably be holding between his knees a map, which he will roll and unroll as he goes along, steering the machine at the same time with one hand and with his feet on the rudder bar.
>
> Some of the flights are almost seven hundred miles long, and if undertaken against a head wind may virtually extend to 850 or 900 air miles, and at the end of that time the pilot must be mentally and

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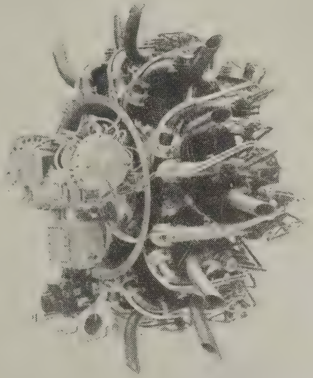

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Petrol Consumption, ·55 pts./b.h.p.
·312 Litres per b.h.p. hour.
Oil Consumption, ·03 pts./b.h.p.
·017 Litres per b.h.p. hour.
Weight, complete:
760 lbs., 346 kgs.

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physically capable of dealing with any emergency which may involve a forced landing in difficult circumstances.

Needless to say, it has taken years for the present pilots to attain their present high degree of all-round skill in these departments, and, unfortunately, the cost in life has been heavy; over twenty British civil pilots have been killed, and an attempt to place a group of ordinary pilots on this class of work must inevitably be followed by the same painful and fatal process of elimination before the present standard is re-attained.

GETTING AT THE TRUTH.

Furthermore certain newspaper correspondents who have been interviewing the pilots have hinted at the true cause of the trouble. One says :—" It is largely a psychological one of confidence." Another says :—" Without full and complete confidence in the ground management they cannot take machines into the air. They state that they have not that confidence at present and until they have they are not prepared to accept service in the new company."

Also, a Mr. Smith, a Socialist M.P., asked in the House on Apr. 2 whether Mr. Leach's attention had been drawn to the dispute " and whether in the interests of civil aviation and the safety of the public he would take immediate steps to remove the source of disaffection and also to arrange that skilled pilots should have a voice in deciding whether in certain conditions flying could be undertaken with safety."

Mr. Smith added :—" Is the Under-Secretary aware that the management now imposed has insisted on airmen having as much as 28 hours' flying time in four days. Is not that a danger to the public ?"

A DIRECT COMMUNICATION.

On Apr. 5 THE AEROPLANE received from some anonymous correspondent a document headed " Federation of British Civilian Air Pilots " and entitled " Summary of the Case for the Pilots." The nineteen paragraphs composing this document are too long to quote but some of them must be quoted because in them lies the whole essence of the dispute. These paragraphs read as follows :—

> (2) The company allowed over three months to elapse before they sought to engage any of the present pilots, in fact it was only on or about Mar. 28 that the first written offer was received.
>
> (3) We are of opinion that this situation was brought about by those acting for the new company in order that we should be compelled to negotiate as a body within a few hours of unemployment.
>
> (6) The members of our Federation have hitherto been engaged upon annual contracts. The new company offer no contract. In a typed letter signed by Col Searle they offer terms subject to one day's notice. The word " day " is scratched through and the word " month " written above it. The original inclusion of the word " day " is an indication of the trend of thought the pilots have to contend with and the word " month " is not a satisfactory substitute for the annual contract hitherto enjoyed.
>
> (7) The company itself has an agreement and subsidy for ten years and there seems no reason why responsible officers of the company such as the present pilots should have their contracts altered from annual to monthly.
>
> (16) Over and above all these considerations both pilots and men state that they have no desire to join the service of a company if it contains an element in the management of which they have such grave misgivings.
>
> (17) We are not on strike . . we merely refrain from becoming employees . . . until the organisation is constructed in such a manner as will ensure as far as possible our personal safety. Over twenty British civil pilots have already been killed.
>
> (19) The 10 years' monopoly granted to the British Foreign and Colonial Corporation establishes a monopoly employer for all those of our members who have borne the burden of the past four years' of civil flying.

THE TRUTH OF THE MATTER.

Unfortunately the Law of Libel prevents one from telling the whole truth of the matter. A great part of the truth is that these silly inexperienced unbusinesslike temperamental young pilots are being made cat's-paws in one of the nastiest little politico-commercial intrigues which one has been obliged to investigate in some thirty years' business experience. But the evident and immediate cause of the trouble is an attack on Colonel Searle the Managing Director of Imperial Airways Ltd. and on Major Woods-Humphery the General Manager by a few disgruntled and disappointed employees of the extinct air lines.

Until a year or so ago civil aviation ventures in Great Britain have in the main been run on the haphazard lines customary before the War 1914-18 and during the war itself, when the main object in running an aeroplane was to get there somehow regardless of organisation and expense. Then suddenly into the aeronautical community arrived Colonel Searle who introduced his strictly businesslike methods which have made such outstanding successes of the London General Omnibus Company and Daimler Hire Ltd. He acquired the assistance of Major Woods-Humphery, a trained engineer who is also a pilot of proved competence and an experienced business man.

They put into operation the Daimler Airway with its scheme of what came to be called " intensive flying " and its highly organised system of engine maintenance, which proved that pilots, engines and aeroplanes could do many times as much work as had ever been expected from them and could go on doing it without undue strain and with the regularity of a good steamship line, if not with that of a railway. The immediate result was an all-round improvement in efficiency in the running and maintenance of other civilian aircraft. And an obvious consequence was that like all exponents of high efficiency Major Woods-Humphery got himself strongly disliked by people who had become accustomed to doing things according to their own sweet will.

These phrases about " confidence " and pilots having " a voice in deciding whether in certain conditions flying could be undertaken with safety " and " organisation constructed in such a manner as will ensure our personal safety " and so forth are all based on the fact that the temperamental pilot objects to flying to schedule time and prefers to keep his machine and passengers waiting till he feels inclined to start.

Those who tried to use air transport in the early days will remember the maddening delays when they were kept hanging about on the aerodrome waiting perhaps an hour or more before a machine was even wheeled out of its shed. Major Woods-Humphery did at any rate insist that the machines should be out on the aerodrome and cleared from the Customs in time to start according to schedule. After that he left it entirely to the pilot's judgment whether he started or not and whether he landed on the way because of bad weather.

MALICIOUS CHARGES.

The enemies of the management of Imperial Airways Ltd. have spread assiduously by word of mouth definite charges that pilots have been crashed and (or) killed because they started by Major Woods-Humphery's orders against their own judgment. The statement also about the " twenty civilian pilots " having been killed is used industriously in this connection.

As a matter of fact the great majority of the twenty killed were not air line pilots at all, but joy-riders or testers. In almost every case they were killed because of their own mistakes. And it ought to be understood thoroughly that in the light of present aerodynamic knowledge most of those mistakes would not have had fatal results if the aeroplanes had been designed to modern ideas.

In one specific case where it has been alleged that a pilot was ordered to fly on pain of dismissal and was killed in consequence one has independent evidence that Major Woods-Humphery did not even know that the said pilot was down for duty that day. And in another case, where it has been alleged that a pilot was ordered to fly back from a foreign air port with a defective engine and made a forced landing (without mishap) as the result, the stoppage of the engine which caused the forced landing was due entirely to the pilot's stupidity or carelessness. One mentions these points merely as illustrating the viciousness with which the attack on Imperial Airways Ltd. is being conducted.

FIND THE GRIEVANCES.

That being so we may now consider the grievances of the pilots as set forth by them.

Firstly there is that matter of the delay in engaging pilots until they were within a few hours of unemployment. If the pilots want to get at the basic reason for that delay they had better consult their friends Mr. Ben Tillett and Mr. Bob Williams. The immediate reason is that the new company by which they had hoped to be engaged was not in fact formed till *after* their engagements with the old companies lapsed automatically on Mar. 31.

Owing to the coming into power of a Labour Government it was obviously impossible for the British, Foreign and Colonial Corporation to float the Imperial Air Transport Company Ltd. on the British Public as a public company until prospective investors could assure themselves that the new Government did not mean Socialism or Capital Levies or Red Revolution or the ruin of British Industry. Consequently the company has not yet been floated. And one imagines that Imperial Airways Ltd. was only registered (*after* the lapse of the old agreements on Mar. 31, be it noted) as a stop-gap for the purpose of keeping the air-lines going until the time is ripe for financial flotation.

The succession of strikes of dockers, 'busmen, shipbuilders and Wembley workers and so forth during the past couple of months has not brought a successful flotation any nearer. East-wind nerves may be largely responsible for those strikes, but Messrs. Tillett and Williams are certainly in a better position than one is oneself to inform the pilots as to the underlying causes of the disputes. And now the widely advertised actions, or inaction, of the pilots have removed still further any chance which the British, Foreign and Colonial Corporation may ever have had of extracting money for aviation from the pockets of John Citizen. Nobody is going to invest in a concern whose employees are liable to fly off the handle before they are touched as the pilots have done.

Under those circumstances the pilots can scarcely blame a non-existent Management for not engaging them. And one

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The above extract from "The Bystander" of 19th March, 1924 refers to the performance of a Napier aero engine on the Instone Air Line, London-Cologne route. 100,000 miles means 1,000 hours actual flying.

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might further point out to them that a week before his own engagement with the Daimler Airway ended Major Woods-Humphery himself, whose job it will be to engage pilots, did not know for certain that he was going to be General Manager of Imperial Airways Ltd. Therefore it is not only ridiculous but malicious for the pilots to say "this situation was brought about by those acting for the new company in order that we should be compelled to negotiate as a body within a few hours of unemployment." That only shows how they are being misled by the people who are pulling the strings behind them—which is what happens in all strikes, as for example in the feud against the Right. Hon. J. H. Thomas which is behind all the recent threats of railway strikes.

THE FARCE OF CONTRACTS.

The twelve-month contract is another piece of nonsense on the part of the pilots. Contracts between employer and employee are as useless in business as are treaties in world-politics. They are just scraps of paper. Any employee can break a contract merely by sitting with his hands in his pockets and doing nothing. And any employer can make things so unpleasant that an employee will be glad to go at short notice. The only contract worth having is a friendly understanding between master and man, and fair play on both sides.

The pilots have gone far towards making a friendly understanding impossible by tacking themselves onto the coat-tails of those two eminent professional agitators Messrs. Tillett and Williams. How little they appreciate the consequences of their action is shown by the reference to themselves in one of their manifestos as "responsible officers of the company such as the present pilots" and by the snobbish phrase "both pilots and men."

On many occasions one has made oneself unpopular with civilian pilots by telling them frankly that when commercial aeroplanes are properly designed and when the ground communications along the air routes are properly organised so that practically all danger in forced landings is eliminated the air pilot will become an aircraft chauffeur with about the status of a decent express-driver on a railway instead of being the gallant young birdman as which he still regards himself. And now these "officers" who differentiate so carefully between "pilots" and mere "men" deliberately go and associate themselves with Mr. Ben Tillett's dockers and Mr. Bob Williams' lorry drivers and the porters of Smithfield and Billingsgate.

The Federation of British Civilian Air Pilots would be perfectly sound as a kind of Club for professional aviators, and might even in time have developed into an Authority like Trinity House. It might have negotiated in a gentlemanly way on behalf of pilots with Government Departments and so forth, much as the Royal Aero Club does on behalf of the Sport of Flying and as the Society of British Aircraft Constructors does on behalf of the Trade. But as a kind of poor relation of the Dockers' and the Transport Workers' Unions even the most democratic pilot must admit that the status of the Federation of Pilots is not exactly exalted.

THE TEMPERAMENTAL PILOT.

As to the individual pilots themselves, they are being fooled because most of them *are* fools—when they become involved in business. For several of them one has a great personal liking and immense admiration for their skill and judgment (as pilots). If one wanted to fly in bad weather on a doubtful aeroplane from here to Moscow (better not say Moscow perhaps as that might be taken as suggesting Bolshevik tendencies among the pilots,—let us say to India) one would rather go with one of three or four of the agitating pilots than with anybody in the World. But if one had to organise an air line to run to schedule on a commercial basis those are the very pilots whom one would refuse to have at any price.

There is one infallible test for an air-line pilot. Ask him whether he can contemplate with a contented mind flying from London to Paris and back (or between London and Amsterdam and back, or between any two other cities about 250 or 300 miles apart) always on the same route for five days a week ten months a year till he qualifies for an old-age pension. If he can say yes truthfully then he is an air-line pilot. If not then he is only fit to be a pioneer of aviation on a new air route, or a business man, or something other than an air-line pilot.

THE ESSENTIALS OF SUCCESSFUL AIR LINES.

For air lines to be successful each pilot must know every hedge and lane and tree along their routes just as an express driver knows every culvert and cutting on his own stretch of line. He must be able to get down anywhere in the dark in case of a forced landing. He must be independent of defective engines, defective compasses, and defective wireless apparatus. In the last resort we have to depend on the man and not on the machine, just as we do on our railways,—which is why the British railways are the safest in the World. And 300 miles of line is enough for any man to learn by heart in an apprenticeship of three years or so.

Two or three years ago one of the pilots now awaiting engagement said that given 200 yards visibility he would guarantee to take an 0/400 Handley Page from London to Paris without hitting anything and to keep it always over ground where he could make a safe forced landing from 300 feet. That is a sample of how every pilot should know his own particular route.

Before a man is allowed to drive a main-line express he has to serve something like ten years on the railway and after driving local trains he has to do a couple of years as a fireman on the express route on which he is to become a driver. Air-line pilots must have similar training before air transport can become reasonably safe.

PROPER AIR-LINE EQUIPMENT.

Also we must have stable machines which do not stall but merely sink when flown below lifting speed. And we must have machines which cruise at more than 100 miles an hour and yet can fly under full control at 45 miles an hour and can land at 40 or less. Such machines exist already, but not as passenger machines. And it is the duty of the Department of Civil Aviation to get passenger machines with similar qualities.

Furthermore we must have proper observation posts along our routes so that pilots are told automatically what are the conditions of wind and cloud and fog at various salient points as they approach them. Such a signal system can be installed along a 300-mile route for a fraction of the cost of the signals on 50 miles of railway.

All the current talk about flying by compass over clouds and relying on infallible engines is wicked and pernicious. And if it persists and prevails it will hold back the progress of civil aviation for years.

We have not yet produced infallible engines for locomotives and steamships. How much less can we expect infallible aero-engines? And so long as there is the danger of a forced landing so long must we depend on a pilot knowing his line and knowing how to get down safely exactly as we depend on an express-driver to get his train safely round certain curves without slowing too much and losing time and without going too fast and wrecking his train.

THE LABOURER AND HIS HIRE.

For such work an air pilot needs no more and no less intellect than does an engine-driver. With proper aeroplanes such as *could* be produced to-day no more skill or judgment is needed to land an aeroplane at Croydon than is needed to land a train at Victoria down the slope from Grosvenor Road or at Euston down the slope from Chalk Farm.

If air lines are ever to be successful they must be as simple and as safe as railways. The simplicity can be secured by competent technical work. The safety can be secured by operating with solid, stolid, phlegmatic pilots and eliminating all temperamental personalities from the flying employees.

At the same time for many years to come there will be plenty of work for the temperamental pilots in the hazardous work of opening new air routes over country where air lines are not yet established. And these pioneers of new routes should naturally be paid on a higher scale than the drivers of the regular air-line machines.

This is a point to which one directs the attention of the management of Imperial Airways Ltd. if they intend to develop Imperial airways and not merely to organise air lines, which is quite a different proposition.

The air route pioneer should be well worth his £750 to £1,000 per annum for he will need the intellect and initiative and education and experience of a field officer of the Royal Air Force. But the air-line driver—when air lines are properly equipped and organised—will need no more skill or education than does the driver of an express train and one fails to see why he should be paid more, especially as he will have less responsibility for human life and the material of his employers.

VERBUM SAPIENTIBUS.

If the officials of the Air Ministry and the management of Imperial Airways Ltd. and the pilots and mechanics who have hitherto been engaged in Civil Aviation will endeavour to grasp some of the foregoing facts they may arrive at something like a sensible way out of their present troubles. Also, in case the newer officials at the Air Ministry owing to their political proclivities may feel that the pilots and the mechanics are being victimised by ruthless slave-driving monopolists, they will do well to investigate further the intrigue which lies behind this manufactured agitation.

The essence of all sound judicial conclusions is Cato's old question *"Cui Bono?"* It is even possible that their own C.A.T.O.s might enlighten them very considerably in this particular matter. And to the agitated aircraft workers, pilots and mechanics alike, one would merely say that there is such a thing as being out of the frying-pan into the fire and that frequently the devil you know is much better than the devil you don't know.

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THE ROYAL AIR FORCE.

London Gazette.

Apr. 1.

General Duties Branch.—Flt. Lt. G. S. N. Johnston is granted a perm commn. in the rank stated (Apr. 2); F. E. Watts is granted a perm. commn. as a Plt. Off., with effect from Mar. 24 and with seny. of Sept. 24, 1922.

The follg. are granted S.S. commns. as Flg. Offs., with effect from and with seny. of the dates indicated:—R. L. Bateman (Mar. 18); E. R. Maddox, M.C. (Mar. 25).

The follg. Plt. Offs. are promoted to the rank of Flg. Off.:—C. E. N. Guest, D. G. Pinnell, A. Malone, F. R. D. Swain, A. M. Rowe (Feb. 21); W. C. Venmore (Mar. 2); A. J. Peacey, B. N. Murgatroyd, O. B. Swain, W. H. Phillips, J. H. G. Franklin, T. J. Woods (Apr. 2).

Flg. Off. H .R. Tyler resigns his S.S. commn.

Stores Branch.—The follg. Plt. Offs on probation are confirmed in rank and are promoted to the rank of Flg. Off. (Dec. 5, 1923):—C G. Bull, E. F. Colman, C. P. Puckridge, C. B. Rawlins, F. C. Warner. Plt. Off. on probation W. R. Donkin is confirmed in rank (Dec. 5, 1923).

Medical Branch.—Flt. Lt. V. R. Smith is granted a perm. commn. in rank stated (Apr. 2); Flt. Lt. (Hon. Sq. Ldr.) G. D. Kerr relinquishes his temp. commn. on ceasing to be employed and is permitted to retain rank of Flt. Lt. (Mar. 19); Flg. Off. J. M. Rourke, M.B., relinquishes his S.S. commn. on account of ill-health (Apr. 2); Flt. Lt. Dumaresque Le Bas is transferred to Reserve, Cl. D.2 (Apr. 1).

Reserve of Air Force Officers.—The follg. Offs. are confirmed in rank, with effect from the dates indicated:—Flg. Offs. W. F. P. Williamson (Mar. 6); A. L. Monger (Mar. 19); N. H. Woodhead, D.S.C., (April 1) Plt. Offs. R. J Weaver (Mar. 14); H. W. Frith (Mar. 16); J R Taylor (March 19).

Appointments.

Week ending Apr. 7.

General Duties Branch.—Squadron Leaders F. H. M. Maynard, A.F.C., to R.A.F. Depot, on transfer to Home Estab., 18/3; J. S. T. Bradley, O.B.E., to H.Q., Iraq, 31/1; N. H. Bottomley, A.F.C., to R.A.F. Depot, on transfer to Home Estab., 16/3.

Flight Lieutenants W. H. E. Kemp, A.F.C., to No. 84 Sqdn., Iraq, 2/3; A. Chapman, to H Q., Iraq, 2/3; D. W. King, to No. 2 Arm. Car Coy., Palestine, 1/12; M. Moore, to H.Q., Egypt, 12/3; G. H. Martingell, A.F.C., to No. 70 Sqdn., Iraq, 17/3; J. L. M. de C. Hughes-Chamberlain, to H.Q., India, 12/3; J. E. MacLennan, to No. 8 Sqdn., Iraq, 7/3; R. S. Sorley, D.S.C., D.F.C., to Marine Aircraft Exper. Estab., Felixstowe, 8/4; E. G Hilton, A.F.C., to No. 58 Sqdn., Worthy Down, 1/4; G. Martyn, to No. 9 Sqdn., Upavon, 1/4; W. H. Markham, to No. 99 Sqdn., Netheravon, 1/4; V. Brodie, O.B.E., to No. 12 Sqdn., Andover, 8/4; B. J. W. Brady, D.S.M., to Arm. and Gunnery School, Eastchurch, 3/4; T A. Langford-Sainsbury, A.F.C., to Egyptian Group H.Q., 6/3; T. O. Clogstoun, to No. 58 Sqdn., Worthy Down, 1/4

Flying Officers B. H. Cook, to Aeroplane and Arm. Exper. Estab., Martlesham, Heath, 10/4; J. H. Gray, to R.A F. Depot, 3/4; I. E. Brodie, to R.A.F Base, Leuchars, 10/4; G. H. Stainforth, to No. 19 Sqdn., Duxford, 10/4; H. J. Gearing, to R.A.F. Depot, on appointment to a S.S. Commn., 1/4; M. W. Nolan, to No. 3 Sqdn., Manston, 1/4; G. W. Birkinshaw, to No. 17 Sqdn., Hawkinge, 1/4; J. Parsons, to No. 2 Arm. Car Coy., Palestine, 1/12; A. Page, to Aircraft Depot, Egypt, 1/2; H. A. Anson, to H.Q., Iraq, 20/8; A. E. Woodbridge, C. E. Barraclough, and B. C. Duke, to No. 58 Sqdn., Worthy Down, 1/4; C. A. Horn, M. W. J. Boxall, H. C. Davies, and J. N. D. Anderson, to No. 9 Sqdn., Upavon, 1/4; F. W. Barkley, F. E. W. Davis, F. W. Mundy, and R. B Fleming, to No. 99 Sqdn., Netheravon, 1/4; H. H. S. Scott, D.S.M., to I.A.A.D., Henlow, 29/3; F. Simpson, and R. C. Higgins, to Air Ministry, 8/4; A. F. McC. Riggs, to No 24 Sqdn., Kenley, 1/4; A. Harnes, to R.A.F. Depot, on appointment to a S.S. Commn., 27/3.

Pilot Officers C. G. H. E. Lumsden, to R.A.F. Base, Leuchars, 8/4; J. E. Doran-Webb, to R.A.F. Base, Leuchars, 10/4; R. D. Dawson to No. 24 Sqdn., Kenley, 1/4; R. H. Bibby, to No. 17 Sqdn., Hawkinge, 1/4; V. J. Hatton, H. R. F Baxter, to No. 99 Sqdn., Netheravon, 1/4; B L Young, F. F. W. Hall, and E. S. C. Davis, to No. 58 Sqdn., Worthy Down, 1/4; J. W. New and E. A. McKinley-Hay, to No. 9 Sqdn., Upavon, 1/4.

Medical Branch.—Flight Lieutenant (Medical) T. R. S. Thompson, M.B., to H.Q., Egypt, 15/10. Flight Lieutenant (Q.M., Medical) J. M. Maxwell, to No. 1 School of T.T. (Boys), Halton, 8/4.

Stores Branch.—Flight Lieutenant (Stores) W. A. O. Honey, to Aircraft Depot, Iraq, 6/3. Flying Officers (Stores) W. B. Frederick, to No. 3 Sqdn., Manston, 1/4; P. H. Wynne-Burt, to No. 9 Sqdn., Upavon, 1/4; W. T. Lewis, to No. 58 Sqdn., Worthy Down, 1/4. Pilot Officer (Stores) C. W. Gore, to No. 99 Sqdn., Netheravon, 1/4.

The Staff College Tour in France.

The Paris correspondent of the Times in a communication dated Apr. 6 states:—

> The British Air Mission, under Air Commodore Brooke-Popham, which has been invited to visit the French military aviation centres, reached the Paris aerodrome at Le Bourget to-day.
>
> Three of the nine aeroplanes conveying the members of the mission reached Le Bourget early in the afternoon. The other six passed over Berck Plage at 1.20, but owing to motor trouble in one of the machines they landed at the Abbeville aerodrome at 1.45. Repairs having been effected, the journey was resumed and the party reached Paris shortly before 4 o'clock.

On Apr. 6 the Mission was received by General Dumesnil, Chief of the Military Aviation Service and the following day was entertained by the officers of the 34th Air Regiment.

The Mission was then broken into three groups. The first group composed of technical officers will remain in Paris and will visit establishments at Le Bourgêt and Issy-les-Moulineaux. The second party has left by air for the Mediterranean air stations. The third group will fly over the north and north-east of France, visiting air stations at Nancy, Metz, and Strasbourg.

Seven of the nine machines belonging to No. 39 Squadron which had flown the Mission to France returned to their unit on Apr. 7, the other two remaining at Le Bourgêt.

A Regrettable Incident.

At Folkestone on Apr. 8 Flg. Off. A. E. T. Bruce and Flg. Off. L. Maynard stationed at Hawkinge were fined £10 and £3 respectively for assaulting two police constables. Mr. Bruce giving evidence said that he was dancing on the pier when he was insulted by a civilian who then ran. He apparently lost his quarry on the beach and mistook for him a plain-clothes policeman who was there. Mr. Bruce apologised in Court to the constable.

It would probably be better for the reputation of the R.A.F if its officers refrained from frequenting places where they are liable to be insulted.

THE R.A.F. SPORTS BULLETIN.

The Individual Boxing Championships.

The Individual Boxing Championships were held at Uxbridge on Apr. 3 and 4 and in order to select representatives for the R.A.F. in the Combined Services' Championships which are to be fought at Portsmouth at the end of this month.

Form was quite up to the average and reflects great credit on the officers and men responsible for the coaching.

The prizes were presented by Air Vice-Marshal Sir Vyell Vyvyan in the absence of Air Chief Marshal Sir Hugh Trenchard who had intended to be there. The R.A.F. and everyone connected with it will be sorry to hear that his attendance was cancelled at the last moment owing to the critical condition of his son Hugh, who has been seriously ill for some days. Everyone will have the utmost sympathy for Sir Hugh and Lady Trenchard in their anxiety and hope to hear very soon of the complete recovery of their son.

The details of the boxing were as follows:—

Other Ranks.

Feather-weights:—(Semi-finals) L/AC. Boteles (Shrewsbury) beat AC Jackson (Henlow) on points. L/AC. Wyatt (Cranwell) beat AC. Roberts (Manston) on points. (Finals) Wyatt beat Boteles on points.

Light-weights:—(Semi-finals) AC. Fanner (Manston) beat Cpl. Bowes (Uxbridge) on points. Sjt Salter (Halton) beat AC. Tate (Henlow) on points. (Final) Fanner beat Salter in an extra round

Welter-weights:—(Semi-finals) AC. Ballantyne (Winchester) beat L/AC. Wood (Henlow) on points. L/AC. Jenkinson (Cranwell) beat AC. Ralph (Shotwick). (Final) Ballantyne beat Jenkinson in the first round.

Middle-weights:—(Semi-finals) AC. Marshall (Manston) walked over AC. Bailey (Gosport) scratched through injuries. Cpl. Higgins (Duxford) beat AC. Rollaston (Halton) on points (Final) Higgins beat Marshall on points.

Fly-weights:—(Semi-finals) AC. May (Manston) knocked out AC. Turton (Manston) in the first round. AC. Williamson beat AC. Turner (H.Q.I.A.). (Final) Williamson beat May on points.

Bantam-weights:—(Semi-finals) Cpl. Barnes (Henlow) beat AC. Ward (Shrewsbury) on points. AC. Bridge (Netheravon) knocked out AC. Kinder (Uxbridge) in the second round. (Final) Bridge knocked out Barnes in the second round.

Light Heavy-weights:—AC. Williams (Manston) knocked out L/AC. Prestley (Eastchurch) in the first round.

Catch-weights:—AC. Forrester (Netheravon) beat AC. Rudder (Manston) on points.

Officers.

Feather-weights:—Flt. Lt. Howard (Winchester) beat Flg. Off. Horsfield (Leuchars) in the second round. Flt. Lt. Walker (Kenley) a bye. (Final) Walker beat Howard on points.

Light-weights:—Plt. Off. Woodfield (Cranwell) knocked out Plt. Off Jackson (Kenley) in the second round.

Welter-weights:—Flg. Off. Mason (Uxbridge) beat Flg. Off. Macgregor (Shotwick) on points

Middle-weights:—Plt. Off. Whinney (Duxford) beat Plt. Off. Lewis (Shotwick) on points.

Light Heavy-weights:—Plt. Off. Scott (Kenley) beat Flg Off. Cavis Brown (Duxford) on points. Flg. Off. Adams (Uxbridge) a bye. (Final) Scott knocked out Adams in the first round.

Hockey.

Army v. R.A.F.—The Army gained an easy victory over the R.A.F. on Mar. 4 at Colchester by seven goals to one.

The R.A.F. held their opponents in the first half and at the interval each team had hit one goal. In the second period, however, the Air Force players did not take advantage of their opportunities, whereas the Army, who showed more dash and were always quick in their movements, had the game their own way. Flt. Lt. Gilley gave a great display in goal for the losers. He had many difficult shots to stop, which he cleared in good style, and it was in no way his fault that he was beaten seven times. Flg. Off. W. D. Gairdner hit the goal for the Air Force. The mattch was played at a good pace and was always exciting.

The R.A.F. team were Flt. Lt. D. Gilley (Andover), goal; Flt. Lt. J. S. Smith (Halton), and Plt. Off. C. F. Roupell (Bircham Newton), backs; Sq. Ldr. L. C. Keeble (Isle of Grain), Flg. Off. Saint (Farnborough), and Flg. Off. G. R. Smythe (Lee on Solent), half-backs; Flg. Off. H. G. Sawyer (Isle of Grain), Flg. Off. C. H. Bird (Uxbridge), Flg. Off. W. D. Gairdner (Gosport), Plt. Off. F. G. Reeves (Gosport), and Flt. Lt. C. G. Wigglesworth (Calshot), forwards.

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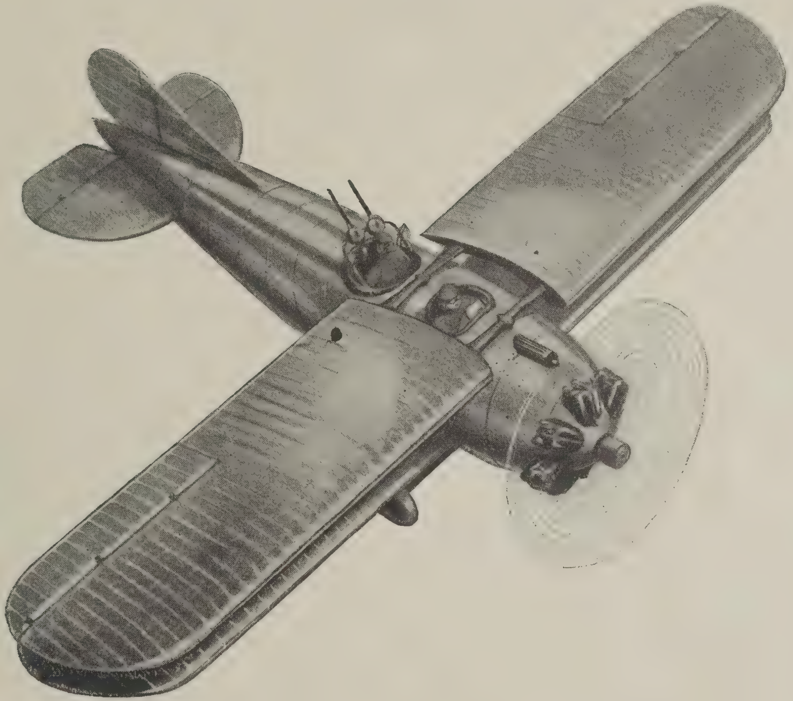

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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THE GLOBE TROTTERS.

The British Team.

Since Mar. 30 Sqdn. Ldr. MacLaren Flg. Off. Plenderleith and Sergt. Andrews have been at Corfu. In a telegram to the Times sent on Apr. 6 Mr. MacLaren says :—

> I regret to say that the trouble is more serious than I anticipated, and this will probably mean our remaining here another ten days. The crew are all well. The machine is still on Lake Korissia, about 20 miles by road from the town of Corfu and very inaccessible; I shall endeavour to get it into the sea and have it towed round to Corfu by a destroyer as soon as the weather is sufficiently calm. We have managed to obtain a small tent, so that the housing problem is solved, and food arrives periodically from Corfu. Depression is gradually wearing off in the sunshine and the hope of making up lost time."

It is understood that besides the stripping of the reduction gear a part of the crank-case was damaged, and although it might be possible to have the damage repaired in Italy, the Napier firm are not prepared to take risks, and, of the alternatives of sending out the necessary parts and a new engine they are choosing the latter course. A Napier Lion "pusher" engine has been prepared and it should by now be on its way to Brindisi in a special truck.

Vickers Ltd. have taken this opportunity of sending out in the same truck a new wing-tip float to carry as a spare. It will be remembered that a float was damaged at Civita Vecchia in taking off

On Mar. 1, Lieut.-Col. Broome, O.B.E., who will be remembered in connection with the attempt made in 1922 to fly round the World, left Vancouver on H.M.C.S. Thiepval for Japan via Alaska, the Aleutian Islands and Kamchatka to lay supply depots for that 5,500 mile portion of the British round-the-World flight.

The Thiepval is an armed trawler belonging to the Royal Canadian Navy and carries sufficient petrol, oil and stores to equip the following stopping places on the Tokio-Vancouver section :—Minatogaura, Yetorup Isle, Paramoshir Isle, Petropavlovsk, Nikolski (Behring Isle), Chicagoff Harbour (Attu Isle), Nazan Bay (Atcha Isle), Dutch Harbour, Chignik, Cordova, Yakutat, Fort Wrangel and Bella Bella.

The U.S. Army Team.

The U.S. Army Round the World Flight which has been delayed at Seattle was due to start officially on or about Apr. 2. On Apr. 6 an attempt was made to leave Lake Washington, Seattle, but further trouble held them up, which postponed the start until the 7th. At first there was difficulty in starting up the engines and then it was found that the Liberty engine in Major Martin's machine was giving 1,500 instead of 1,700 r.p.m. When this difficulty had been overcome Major Martin's airscrew was broken and in attempting to remove the broken airscrew, a mechanic dropped a spanner which punctured one of the floats.

On the 7th the four machines got away from Lake Washington and arrived at Prince Rupert Harbour British Columbia a distance of 650 miles in 8 hours. Three machines landed safely in a blinding snowstorm but Major Martin's machine sustained damage, two float undercarriage struts being broken, which will delay the flight to Alaska for a further two days.

General Festing Leaves the Air Ministry.

Among the latest victims of economy at the Air Ministry is Brigadier-General Francis L. Festing, C.B., C.M.G., who vacated on March 31 the post of Controller of Aerodromes and Licences in the Directorate of Civil Aviation. Everybody who has ever had anything to do with him will be sorry to hear that he has left the Air House.

Soon after General Trenchard took command of the Royal Flying Corps in the field during the War 1914-18 Francis Festing, who was an officer of the Northumberland Fusiliers, was appointed to his staff to take charge of personnel. In that post, which he held up to the time of the Armistice, some thousands of R.F.C. and R.A.F. officers passed through General Festing's hands and among all one's very numerous acquaintance in the Flying Services one has never heard an ill word spoken of him. He was the very embodiment of kindliness and courtesy and many young officers of the R.A.F. owe their present success to General Festing's consideration in appointing them from uncomfortable squadrons to others in which commanding officers proved more congenial.

Shortly after the Armistice, when Mr. Holt Thomas formed Air Transport and Travel Ltd., as a subsidiary of the Aircraft Manufacturing Company Ltd., General Festing joined him along with General Brancker to organise the personnel and in this capacity his amiability won him friends among all classes just as it had done during the War. Later when A. T. and T. Ltd. came to grief General Festing was appointed to be Controller of Aerodromes and Licences in the Department of Civil Aviation.

Whether he was dealing with a pilot who felt himself aggrieved or with the ambassador of some foreign nation or with an aeroplane-load of Continental senators he made each and all of them feel that he was a personal friend and did everything he could to make for amicability.

There is no doubt that Francis Festing ought to be in the Diplomatic Service, for nobody could be more fitted to promote friendly relations with foreigners or to guide negotiations smoothly through our own Government offices. As an exponent of the *suaviter in modo* he is unrivalled and he can on occasion display the *fortiter in re*, though his natural inclination is to show that it is all done by kindness. One hopes very soon to be able to publish the news that General Festing has been appointed to some post where his exceptional qualities can be of real value. And his very numerous friends will wish that he and his valuable experience may not be lost to aviation.—C. G. G.

A Successful Debut.

The Handley Page monoplane with a 200 h.p. BR2 engine and with slotted wings which has been built for the American Navy succeeded in attaining a speed of 146½ m.p.h. in its first speed tests at Martlesham piloted by Mr. F. P. Raynham.

The Flight round Australia.

Wing Commander S. J. Goble and Flg. Off. McIntyre, R.A.A.F. who (as notified last week) are attempting to fly round Australia for defence investigation purposes left Melbourne at dawn on Apr. 6 on a Fairey III D seaplane (360 h.p. Rolls-Royce Eagle VIII engine) arrived at Melbourne on the same day, having accomplished the first stage of their journey in 10 hrs. 20 mins.

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THE PASSING OF B.-W.

Brigadier-General R. K. Bagnall-Wild, C.M.G., C.B.E., who has held the position of Director of Research at the Air Ministry since the end of 1921 vacated that position on Mar. 31st when officially at least the duties of Director of Research ceased, to be divided on Apr. 1 between a Director of Technical Equipment and a Director of Scientific Research.

From the far-off time when General Bagnall Wild took over the organisation of A.I.D. during the war until his retiral from the position of Diretcor of Research he has played an extremely important part in the affairs both of the Royal Air Force and those of the Aircraft Industry, and he has discharged his extremely variegated functions in a manner which has given more general satisfaction to all those who have had to deal with him than could reasonably have been expected considering the difficulties innate in the position which he occupied.

His success as Director of Research may be traced to his by no means usual personal qualities. Brig.-Gen. Bagnall-Wild is one of those essentially cheerful people who are nevertheless capable of violent offence when offence becomes necessary for defensive purposes. He had the capacity for transgressing all the orthodox forms of Departmental procedure without officially committing his department to irregularities. Thanks to these qualities he was generally able to get such things as needed doing done with a little more despatch than is habitual in Government offices, while at the same time he made good use of the natural impedance of "Official Channels" to the carrying on of such schemes and projects as seemed to him to be misguided or mischievous.

Technically he possessed a wide general engineering knowledge without any signs of the prejudices which so often accompany a specialised knowledge of one particular branch of technical work. As a result he was quick to appreciate the value of the results which might be achieved by novel experiments without being unduly conscious of the difficulties which might be encountered in their prosecution to a successful end. It has thus happened that he has successfully extended his encouragement to quite a number of undertakings for which the experts of his department have quite certainly prophesied nothing but disaster. It is pretty certain that in the process he has backed experiments which have been utter failures—from the purely material point of view—but a sane view of the history of human effort can only lead to the conclusion that no experiment is so enlightening as the utter failure except the successful one.

No one with a reasonably accurate knowledge of the aeronautical history of the past few years who desires adversely to criticise the administration of the Department of Research need feel that detailed evidence is lacking to support his case. On the other hand no one with an equal knowledge of the facts who wishes to assess justly the personal responsibility for the present state of affairs can fail to realise that but for the personality of Gen. Bagnall-Wild things would have been very much worse than they are. It is to be hoped that his two successors will deal as happily with their parts of his problems as he has with the whole.—W. H. S.

THE AIR MINISTRY AND LIGHT AEROPLANES.

The Air Ministry appears to be determined to do as much as is possible to render the forthcoming Light Aeroplane Competition a source of trouble, annoyance and expense to the competitors.

It will be remembered that the [illegible] of the Ministry to offer a substantial prize for two-seater machines was announced very shortly after the close of last year's Light Aeroplane Trials. The rules and regulations for this year's contests have been the subject of very careful consideration by the Racing Committee of the Royal Aero Club, who have throughout been in consultation with representatives of the Air Ministry and the S.B.A.C.

A general agreement on the form of the regulations was reached some long time ago, but owing to the difficulty of obtaining official approval of the rules by the Air Ministry it was not possible for the Aero Club to issue the rules to the public until the beginning of March. After a lapse of nearly a month the Air Ministry has now called for a revision of the rules relating to Certificates of Airworthiness Particulars of this revision are given in the following communication from the Royal Aero Club

TWO-SEATER LIGHT AEROPLANE COMPETITION, 1924

The Royal Aero Club has received a communication from the Air Council stating that on further consideration it has been found necessary to modify the proposals regarding Certificates of Airworthiness, which appear in Supplementary Regulations No. 1 of the Competition, issued by the Royal Aero Club

The amended Regulations are attached

SUPPLEMENTARY REGULATIONS NO. 2.

Air Navigation Regulations.—Airworthiness Certificate.

Intending Competitors may in the ordinary way, if they desire, obtain Certificates of Airworthiness for general flying (i.e., including aerobatic flights) for the light aeroplanes entered by them, but this will not be insisted upon as a definite condition of entry.

Exemption from the requirement to possess a Certificate of Airworthiness will be granted by the Secretary of State under Article 26 (1) of the Air Navigation (Consolidation) Order, 1923, in the case of light aeroplanes entered for this competition whilst flying to or from the competition or whilst taking part in it, subject to the following main conditions:—

(a) The Aeroplanes must be certified by the Air Ministry as conforming with the special airworthiness requirements for light aeroplanes so far as the structure of the aircraft is concerned.

(b) Standard type and production tests will not necessarily be required for the engine, but exemption from such tests will be at the discretion of the Air Ministry.

Application for the certificates referred to at (a) above should be addressed to the Secretary, Air Ministry (C A.L.).

To avoid delay firms proposing to build light aeroplanes for this competition should notify the Air Ministry who would then arrange for an official to visit the firms' works in order to inspect the General Arrangement Drawings and check the designers, stress calculations. The Air Council reserve the right to call for such drawings as are normally required for a Certificate of Airworthiness.

SPECIAL CONDITIONS AND REQUIREMENTS APPLICABLE TO AIRCRAFT ENTERED FOR THE COMPETITION.

Certificates of Exemption from airworthiness procedure for the purposes of the above competitions will be issued by the Air Ministry under the following conditions:—

1. The aircraft shall satisfy the technical requirements laid down for Certificates of Airworthiness in C.A. Form 65 with the exception of the requirements outlined in para. 3 relative to engines.
2. Type and endurance tests for engines will not necessarily be insisted upon, but this concession will be at the discretion of the Director of Research, Air Ministry. In the case however of this concession being granted it will be necessary for the engines to be run both on the ground and in the air for a period of at least one hour in each case to the satisfaction of the Director of Research.
3. As regards strength of structure, the standard required for the certificate of exemption is that for the aerobatic class (3rd category) Certificate of Airworthiness as laid down in A.M. 778, with the following exceptions:—

Cases (a1) and (a2).—(Centre of pressure forward, engine on, and engine off)—Load Factor 6.

Case (b).—(Centre of pressure back)—Load Factor 4½.

The additions and alterations, as described in C.A. Form 65, Technical Requirements, para (2), will still apply.

From a casual perusal of the new supplementary regulations the uninitiated might imagine that the new requirements are in effect of the nature of a relaxation of the original demand, and there is little doubt that these regulations have been drafted in an effort to produce that impression.

In fact the original rules called for a Certificate of Airworthiness of "normal" category—that is of the type issued to normal civil aircraft not licensed for stunting. The new regulations permit the designer—if he will—to apply for the "general" or aerobatic licence with its much more stringent requirements as to strength, but announce the Air Ministry's gracious willingness to accept a standard of structural strength less than is necessary for a "general" certificate, but appreciably higher than is required for the "normal" certificate originally called for.

Also in the original rules it was stated that certificates of airworthiness for the engines would not be required. It is now announced that engines may be exempted from passing standard type and production tests, but that such exemption will be at the discretion of the Director of Research. Incidentally the post of Director of Research ceased to exist as from Apr. 1, so that to be eligible for the competition it is apparently necessary to satisfy a non-existent officer as to the reliability of the engine to be used.

As regards the increased factors required in the structure of the competing aeroplanes the change actually made is probably not of very serious importance in the majority of cases. In the case of machines on which work has already started however it may involve quite an appreciable amount of redesigning and possibly the scrapping of already completed parts.

In regard to engines the position is much more serious for it means that the Air Ministry can do what they like as to rejecting engines, except in the case of the one engine—the Bristol Cherub—which has actually passed type tests. For practical purposes this means that every designer must arrange so that he can use the Cherub if no other engine is accepted by the A.M., and even then the A.M. may refuse to allow that engine to be used except at speeds and powers covered by the type tests.

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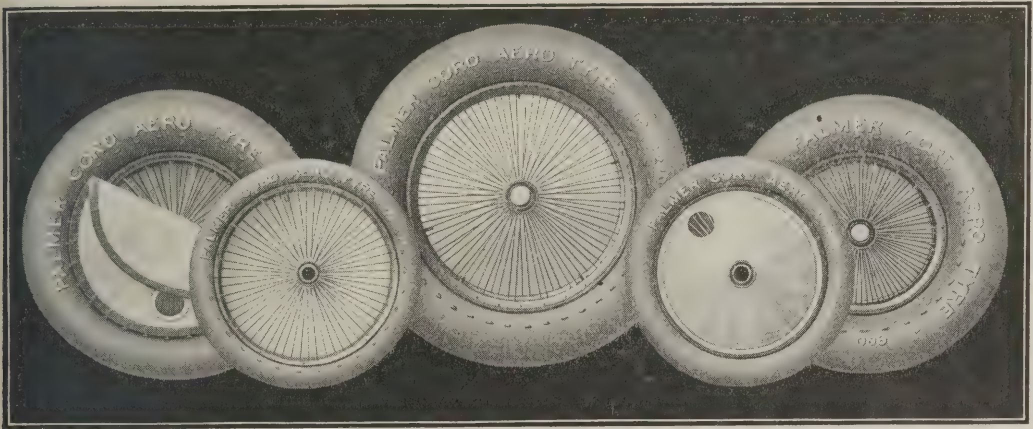

STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
375×55	168	111.12	25.4	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	161*	185.	55.	135/50
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	141	250.	80.	Central
,,	150	185.	55.	Central
,,	167	185.	55.	125/60

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	201	185.	60.32	125/60
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

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S/NK (240)

It is improbable that the Air Ministry will in fact exercise the powers which it reserves in this matter in an unduly oppressive way. But their action in the matter—in totally altering the basic conditions of the competition after the rules have been issued to the public amounts practically to a breach of faith with the Royal Aero Club and with intending competitors.

It is also an excellent example of the utter hopelessness of permitting a Government Department to interfere in Technical and Industrial affairs

This particular matter is the more inexcusable in that the whole subject of Airworthiness Certificates for light aeroplanes has been before the Air Ministry for months. The technical officers of the department concerned have undoubtedly given the questions involved a great deal of consideration and have been prepared with their recommendations for some time past.

Unfortunately the issuing of technical regulations is quite outside the sphere of the technical officers who are responsible for drawing up such regulations. That is the business of some immensely superior person who probably has not the vaguest idea of what the regulations mean. What appears to have happened is that some such superior person after having approved the wording of the original rules discovered that these rules did not mean what he thought they meant and did not square with the recommendation of his Technical Advisers.

If Government Departments were subject to the rules of normal commercial morality the result of such a display of carelessness and incompetence would be the dismissal of the responsible official and the assumption by the Ministry of the responsibility for his failure. As things actually are the unfortunate private concerns who have to deal with the Ministry have not only to bear all the consequences themselves, but have to continue to be properly respectful to those who so continuously afflict them.

Model Tests and Full Scale Results.

The following letter has been received :—

Will you kindly qualify your representation of the writer's views on dynamical dissimilarity and the resulting "scale-effect" in passing from model to full-size.

The remark that Prandtl's correction for wind channel effects removed the heaviest discrepancies was confined to wings within the flying range. On the resistance and mutual interference of bodies of other shapes please count the writer among the pessimists as to any hope of a simple and effective solution.

It is true that we can write down the general equations of viscous fluid motion and that these if valid justify Rayleigh's conditions for dynamic similarity, but they give no criterion of the extent of the dynamic dissimilarity if the conditions of similarity are not fulfilled It is possible to produce two configurations of flow in which there is geometrical similarity of boundary and kinematic similarity of flow, yet one of these configurations may be very stable and the other so unstable that it begins to break down completely the instant it is formed.

The real problem confronting the aerodynamician is to find some criterion which will tell him when he is comparing two states of flow which are closely similar kinematically and for which the dynamic dissimilarity is therefore probably small in effect, and will warn him when the two states are kinematically and dynamically wildly dissimilar.

This letter will show that the writer does not under-estimate the work which has been undertaken by the Committee of which Capt. Farren is chairman.

(Signed) A. R. Low.

[The remark to which Major Low alludes in the first paragraphs of his letter will be found on page 268 of the issue of March 26th in the report of the discussion on Capt. Farren's paper. It would have been better to have made it clear that Major Low in this referred to wings only, but it is fairly obvious that Prandtl's corrections can only be applied to wings and—from memory—it is believed that Major Low actually left that fact to be inferred by his audience. In regard to the final paragraph one had no sort of intention of disparaging the importance of research into this very complicated problem of the relation between models and full scale aeroplanes. It was rather sought to suggest that the scale-effect problem was unlikely to be solved in any completeness for some considerable time and that to hold up experimental aeroplane design because the problem is still unsolved scarcely seems to be justified by the extent of the uncertainties involved.—W. H. S.]

Where the U.S. can beat Us.

The manners and customs of some British newspaper writers when dealing with aviation are wonderful but the American journalist when he really gets going leaves our best efforts out of sight. In a paper by the name of the Brooklyn Standard Union, of Sunday Jan. 27 a space equivalent to at least one and a-half pages of THE AEROPLANE is devoted to a landing device which has been evolved by a Brooklyn firm of building contractors.

This device is to solve all the difficulties of providing landing spaces in populous places. By its aid it is claimed that the largest aeroplane—10,000 tons is the figure mentioned—can safely be landed on the roof of a skyscraper.

The letterpress claims that this size of "ship" flying at 60 m.p.h. can be pulled up in 150 to 200 ft. without "nosing over." The head-line writer, however, who seems to have a better sense of proportion than the author of the notice itself suggests that this feat can be accomplished on the skyscraper without "nosing it" (the skyscraper) "over"—which would indeed be a great achievement.

The epoch-making device is an inclined platform 60 ft by 175 ft., mounted on a turntable so that it may be faced into the wind, sloped so that the aircraft lands up a 15° slope.

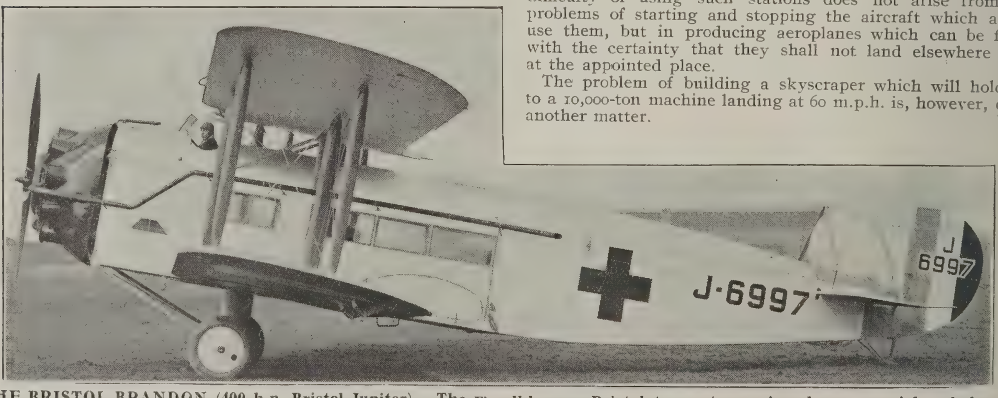
The platform is equipped with a number of devices, all of which—with one exception—appear to have already been used as aids to deck-landing. The exception is of marked ingenuity. The floor of the platform is made in the form of a grid and large ventilating fans are fitted below this grid to draw air downwards through it. In this way the remanent lift of the machine is destroyed—in fact an artificial down-draught is produced when the machine gets to the platform.

The newspaper states that "Aerial ferries floating majestically in and out of lofty slips (meaning the above-described device) far above the city's crowded streets would indeed make New York more than the wonder city of the world."

Quite what this means one does not profess to know—but there is a good deal more of precisely similar meaning.

There is very little room for doubt that eventually landing platforms with equipment on somewhat similar lines to those described, together with catapult gears for launching, will be used at important air stations in populous districts. But the difficulty of using such stations does not arise from the problems of starting and stopping the aircraft which are to use them, but in producing aeroplanes which can be flown with the certainty that they shall not land elsewhere than at the appointed place.

The problem of building a skyscraper which will hold up to a 10,000-ton machine landing at 60 m.p.h. is, however, quite another matter.



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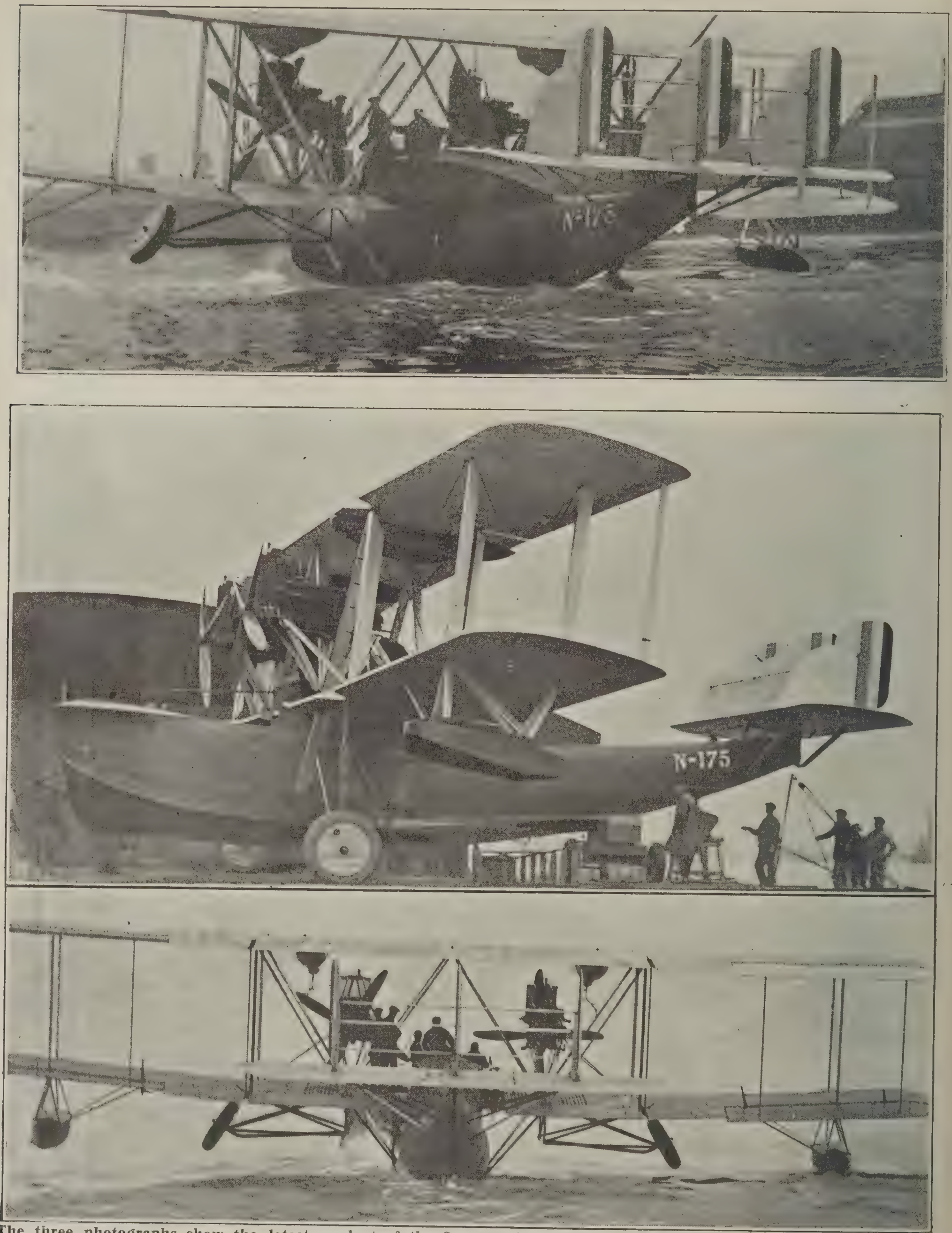

The three photographs show the latest product of the Supermarine Aviation Works Ld.—the first amphibian flying boat to be built with twin engines (Rolls-Royce Eagle IXs.).

The Supermarine Twin-engined Amphibian.

The new twin-engined Supermarine Amphibian flying-boat underwent preliminary trials on Mar. 25. The machine was designed for commercial passenger-carrying, but the first of the type has been acquired by the Air Ministry, so that the type has become secret in technical detail.

This is the first twin-engined amphibian yet built and on her first trip proved herself to be extremely satisfactory.

The Institution of Aeronautical Engineers.

It is announced that the lecture on Radial Engines for Aircraft, which was to have been read by Mr. S. M. Viale on April 11th, has been cancelled, and that no meeting will take place on that date.

The visit to the National Physical Laboratory, announced to take place on April 23, has been postponed because that date clashes with the opening of the British Empire Exhibition at Wembley.

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 13; Tuesday, 6; Wednesday, 4; Thursday, 3; Friday, 7; Saturday, 7; Sunday, 4

London—Paris—Zurich :
Handley Page Transport, Ltd., machines 3, passengers 20, freight nil.

Manchester—London—Rotterdam :
Daimler Airway, machines 4, passengers 4.

Paris—London :
Air Union, machines 25, passengers 128, freight 13,492.

London—Rotterdam :
K.L.M., machines 12, passengers 27

Special Machines : 0

Total number of trips by British machines : 7, carrying 24 pas. Foreign machines : 37, carrying 155 passengers.

Comparative Figures :
For week ending April 6 :
Machines, 44; Passengers, 179; Crews, 76, Total personnel, 255.
Corresponding week, 1923 :
Machines, 93; Passengers, 417; Crews, 156; Total personnel, 573.
Corresponding week, 1922 :
Machines, 60; Passengers. 137; Crews, 100; Total personnel, 237.
Corresponding week, 1921 :
Machines, 58; Passengers, 210; Crews. 78; Total personnel, 288.
Corresponding week, 1920 .
Machines, 36; Passengers, 45; Crews, 40; Total personnel, 85.

Croydon Notes.

With the exception of a few odd machines belonging to the old firms returning from abroad on Monday no British machines have operated the Air Lines owing to the fact that the dispute between the pilots and the management of Imperial Airways Ltd., is still in progress. The facts origin and progress of the dispute are discussed in a special article this week.

The French and Dutch Air Lines are having a regular royal time this week and from Tuesday, the day on which British operations ceased, thirty-one machines flew only five of which were without passengers and those were full of goods. It is certainly regrettable to see good money going abroad which should be going to the British firm and eventually some of it (albeit in " tuppences ") to the pilots, but one is confident that once the British lines resume, it will not be difficult to attract custom back again.

While there is so much disinclination on the part of pilots to become engaged it is pleasing to record the engagement (matrimonial) of Mr. Cyril Holmes who was for nearly three years engaged with one or other of the cross-Channel lines and is now with the Bristol Aeroplane Company Ltd. Mr. Holmes' engagement to Miss Mona Brock was announced on Monday and everyone will offer him and his fiancée their congratulations.

The only sign of British Aviation at the aerodrome has been in the region of the Aircraft Disposal Company Ltd. where Mr. Perry has been testing four Bristol Fighters. Mr. Perry's " B " certificate has just been renewed. Considering his cross-Continental flights to Bucarest and Athens in the worst of weathers he certainly deserves to be classed among our best aerial navigators, whatever may be his scientific accomplishments.

Schneider Cup Entries.

It is unofficially announced that the Royal Aero Club has entered for the Schneider Cup. It is understood that a float machine and a flying-boat will represent Great Britain.

It is officially announced that the Italian Royal Aero Club has entered three seaplanes for the Schneider Cup Race.

An Appointment.

It is announced that Mr. William Leach, M.P., Under Secretary of State for Air, has appointed Mr. R. J. Wilson, M.P., to be his Parliamentary Private Secretary.

Endowment Policies for Pilots.

That well-known insurance firm, Bray, Gibb and Co. Ltd., has an interesting scheme of endowment for pilots. The idea is to meet the case of the pilot who at the end of his " flying life " has no further prospects in the sphere of aviation and wishes to have some capital at his command out of which he can purchase a partnership or interest in a business. The scheme also provides for the payment of the capital sum insured in the event of the death of the insured from whatever cause before the maturity of the endowment, so that the married man can feel that whatever happens to him at any rate his wife and family are protected.

The idea originated with Mr. E. R. Adams, who was, one believes, the first person in the Insurance business to take aeronautical risks. Mr. Adams may in fact justly claim to be one of the pioneers of British Aviation for he has been insuring aviators and aeronautical material at his present office longer than one cares to remember. He has had unrivalled opportunities of studying aviators and their ways and he will one knows be delighted to give advice to any one contemplating insurance of this kind if they will communicate with him at 166, Piccadilly, W.1.

American Air Legislation.

A Bill creating the Bureau of Civil Aeronautics in the Department of Commerce which was introduced on Jan. 8 1923 by the Hon. Samuel E. Winslow, Chairman of the House Committee on Interstate and Foreign Commerce was re-introduced before the 68th Congress on Dec. 13 1923.

The New Bill H. R. 3243 is essentially the same as the old. It is believed and hoped that the Bill having the endorsement of all Federal Departments interested in the development of Aviation, will pass Congress this session.

An Esthonian Air Line.

In connection with a note that appeared under the above heading in a recent issue of The Aeroplane, a communication has been received from Mr. Robert Holst, the founder and Director of Aeronaut Transport Co. of Tallinn (Reval).

He says that it was twice incorrectly stated that the company has been bankrupt, whereas the Company has always been able to meet its liabilities, and that it possesses property which could many times cover the few outstanding debts. The regular service between Tallinn and Riga was temporarily suspended by the company because the service could not be made to pay without State assistance but the service between Tallinn and Helsingfors was still maintained.

It is claimed that the Aeronaut Co. of Esthonia is one of the few companies in the world running regular services without State subsidy. Very satisfactory results were obtained by the Company in the winter season of 1922/23 when owing to the impassible ice in the Gulf of Finland navigation between Esthonia and Finland had to be suspended. A regular air service was kept up, several flights being made daily.

The company now possess seven six-seater monoplanes, with heated cabins, built in Tallinn, two Junkers seaplanes and two three-seater monoplanes. Aeroplane sheds of ferro-concrete have been built and suitable accommodation for workshops, pilots and passengers has been provided.

The suggestion that the Aeronaut Co. is a branch of the Junkers Co. is incorrect the capital being purely of Esthonian origin, and the management is in the hands of Esthonian subjects.

Co-operation with the Latvian Air Service and the Junkers Co. was arranged solely with a view to facilitate air traffic between Berlin and Helsingfors and in no way affects the independence of the Aeronaut Co.

By Error.

Owing to an error in transcription it was stated in The Aeroplane of Mar. 26 that the climb of the D.C.1 Fokker with a 450 h.p. Napier Lion engine was 20,000 feet in 35 minutes. This should have been 20,000 feet in 25 minutes. Ten minutes' difference in such a height is obviously a matter of considerable moment in a Service machine.

A Light Aeroplane for Sale.

The Addlestone Aeronautical Association, that sporting syndicate which was formed primarily with the object of paying for the construction and operation of one of the A.N.E.C. monoplanes entered for the competitions at Lympne last year is now open to receive offers for the single-seater which performed so well in those trials.

The machine was flown by M. J. H. James and Mr. Maurice Piercey. It has a Blackburne engine and has been granted an airworthiness certificate. The machine can be seen by appointment by applying to the Addlestone Aeronautical Association Ltd., The Beeches, Addlestone ('Phone, Weybridge 6).

PERSONAL NOTICES.

Death.

PLEDGER.—On Apr. 4, at West Hennett, Wilts., as the result of a flying accident, Jack Hamilton Pledger, Plt. Off , R.A.F. Mr. Pledger who was under instruction at No. 1 F.T.S Netheravon, was flying at a height of 1,000 ft. when his machine caught fire and crashed.

Engagements.

MONTGOMERY—DARRAGH.—The engagement is announced between Flt.-Lt. T. Montgomery, R.A.F.M.S., son of the late Mr. Samuel Montgomery and Mrs. Montgomery, of Parkhall, Antrim, and Mary, only daughter of Mr. Robert Darragh, J.P., and the late Mrs. Darragh, of 3, Easton Gardens, Cliftonville, Belfast.

HOLMES—BROCK.—The engagement is announced between Cyril Thomas, younger son of the Rev. W. P. and Mrs. Holmes, of Porlock Rectory, Somerset, and Mona, only daughter of Mr. and Mrs. E. N. Brock, of West Hill Cottage, Oxted, Surrey.

HOLLAND—BRUNYATE.—The marriage arranged between Capt. J C. F. Holland, D.F.C., Royal Engineers, and Miss Nancy Brunyate will take place on Apr 23, in the parish church, Cuckfield, Sussex.

Births.

SLESSOR.—On Mar. 31, at 64, Albert Hall Mansions, S.W.7, the wife of Flt.-Lt. John Cotesworth Slessor, M.C., R.A.F.—a daughter.

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

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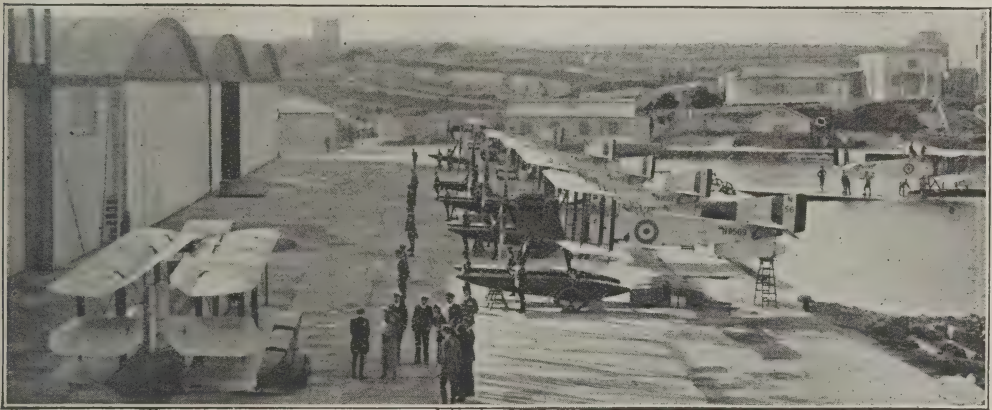
THE MEDITERRANEAN COMMAND.



AT THE MALTA BASE:—An Inspection of the R.A.F.'s Seaplane Station by the Queen of Roumania. The machines on view are all Fairey III.Ds, with Napier Lion engines.

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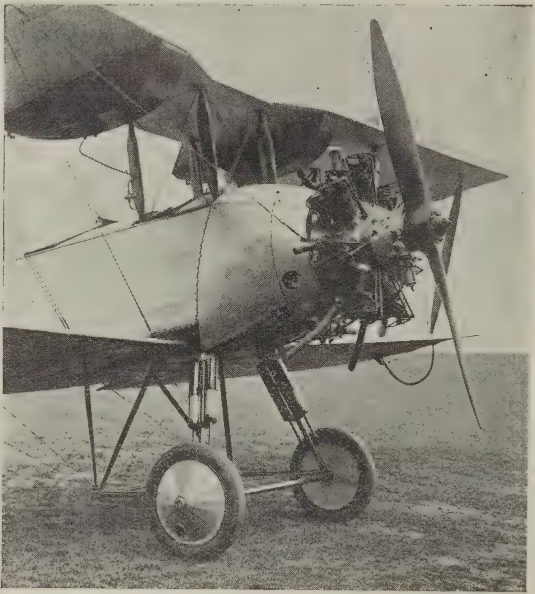

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APRIL 16, 1924.

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ON CIVIL AVIATION FATALITIES.

So much has been written and said during the past two or three weeks of the fact that twenty-one British civilian pilots have been killed in aeroplane accidents since the war that it has seemed necessary to collect a list of those so killed. It will be remembered that the pilots who refused to join Imperial Airways Ltd. published a manifesto to the newspapers and emphasised in it the number twenty-one in support of their argument that an air line pilot should be paid at about the same rate as a Wing-Commander in the Royal Air Force.

The impression was thus conveyed that twenty-one British pilots had been killed while operating air-line machines in the period of less than five years since the first air line was started by Air Transport and Travel Ltd. in 1919. Naturally people who read this manifesto as it appeared in the newspapers were duly impressed and doubtless sympathised with the pilots in being compelled by bad trade and by their ignorance of any other means of making a living to follow such a hazardous trade profession or occupation. But the impression was also conveyed that flying is so dangerous that anybody who travels by air must be either very brave or very reckless.

This presumably is not the idea of civil aviation which it is most desirable to impress on prospective air-line passengers, seeing that any new air traffic company—whether Imperial Airways Ltd. or any other which may supplant it if it should be wrecked by the intrigue against it—must eventually succeed or fail by its passenger traffic. Also the pilots would have done well to remember that the greater the number of passengers who can be lured into air-line machines the greater will be the mileage they will be asked to cover, the more will be the machines needed and the more employment there will be for new pilots and the greater will be the prosperity of everybody employed in Civil Aviation.

Nothing could be better calculated to frighten away passengers than that insistence on the awful danger of being an air line pilot. That it should have been introduced is merely another example of the too-clever-by-half methods of the *agents provocateurs* who have been misleading the poor innocent pilots. As a tactical error it is about on a par with attaching the pilots as transport drivers to the coat-tails of Mr. Ben Tillett and Mr. Bob Williams while at the same time claiming that they are gentlemen and entitled to salaries far greater than those which would seem like a fortune to any middle-aged professional man whose education has cost him ten years and his parents several thousands of pounds.

It is in the hopes of removing some of the atmosphere of terror with which the pilots' misleaders have surrounded air transport that one publishes the list which follows. One does not hope that the Great British Public will read it in this paper. But one does hope that regular readers of The Aeroplane will use the information in discussing Civil Aviation with their friends. And possibly some readers may even use it to persuade newspaper editors of their acquaintance to publish autogenous articles conveying similar information—for one never expects any newspaper to quote from The Aeroplane with acknowledgments of the source of information, although one has noticed in the past thirteen years that eventually the daily news-sheets always adopt the views originated in this paper

Air Line Deaths.

First of all it is necessary to give the names of the pilots killed in actual air-line flying, so as to remove the utterly erroneous idea that twenty-one pilots have been killed in that occupation. The total number so killed has been five in four accidents. Their names are as follows :—

Bradley :—Killed in the winter of 1919 through flying into a hillside near Caterham while trying to get through to Hounslow from Paris when the clouds were down on the hill-tops. An American passenger was killed with him. The accident may be attributed to excess of zeal, as the pilot could have landed while visibility was still fair.

Bager :—Killed in December 1920 with his mechanic and two passengers. Flew into a tree near Golder's Green when starting for Paris from the Handley Page aerodrome at Cricklewood. Visibility was bad, but the accident was visible from the aerodrome. The probable reason for the accident was a forced descent owing to ignition trouble, and that the pilot in seeking to remedy the trouble failed to notice the tree which caught one wing-tip. The wreck caught fire. Three foreign passengers escaped through a cabin window. Two other foreigners did not see that there was an emergency exit in the roof and were burned to death. An Englishman in the nose was thrown clear.

Duke :—Following a railway line in France when visibility was bad flew head on into a French machine following the same line in the opposite direction. The pilot and the cabin-boy (the only passenger) were both killed. Such an accident could not occur if air routes were equipped with proper wireless control posts on the ground and if air lines used machine capable of flying and landing slowly.

Pratt and Robinson :—Stalled and dived into the ground when landing voluntarily in bad weather (rain but not fog). The landing may have been enforced by the passengers, and movement of the passengers may have accentuated the stall and subsequent dive. Such an accident could not happen if aeroplanes were so designed as to sink when stalled instead of diving. Mr. Pratt was a new pilot who had wrecked a machine at Rotterdam shortly before. He was given another chance by the management of the line and Mr. Robinson, a senior pilot, was with him to watch his performance but had no mechanical control over the machine. Three passengers were killed.

That is the complete list of pilots killed in regular air-line work. Moreover it is the complete list of British pilots killed while in the employ of the air lines. So far as one can discover no blame for any of these accidents can attach to the management of any of the air lines concerned unless one argues that the management should not have operated with machines which were passed as fit for service by the Technical Department at the Air Ministry but should have ceased to operate until some aeroplane manufacturer produces machines which will fly slowly and will not stall, as they can be produced to-day. Probably everybody, pilots included, will agree that such inaction would not have been conducive to the progress of Civil Aviation.

The Deaths of Independent Pilots.

We may now proceed to study the fatal accidents to British pilots who held civilian certificates other than pilots in the employ of air lines. The names alone have been acquired from various sources, including the Air Ministry. Naturally the Ministry does not commit itself to any other information and the opinions expressed are one's own, based on the facts obtainable at the time. This list amounts to twenty-five names as it includes several British pilots who were killed abroad. Although the number is greater than that in the propagandist manifesto published by the unemployed air-line pilots the facts concerning the accidents will, one believes, do nothing to decrease confidence in the future of flying. The list is as follows :—

Alcock (Sir John) :—Killed while landing in fog in France through trying to jump an amphibian flying boat over a wire fence to avoid running into it and damaging the machine which he was flying to the Paris Aero Show. The machine stalled and dived but was little damaged. Sir John's neck was broken by a comparatively slight impact.

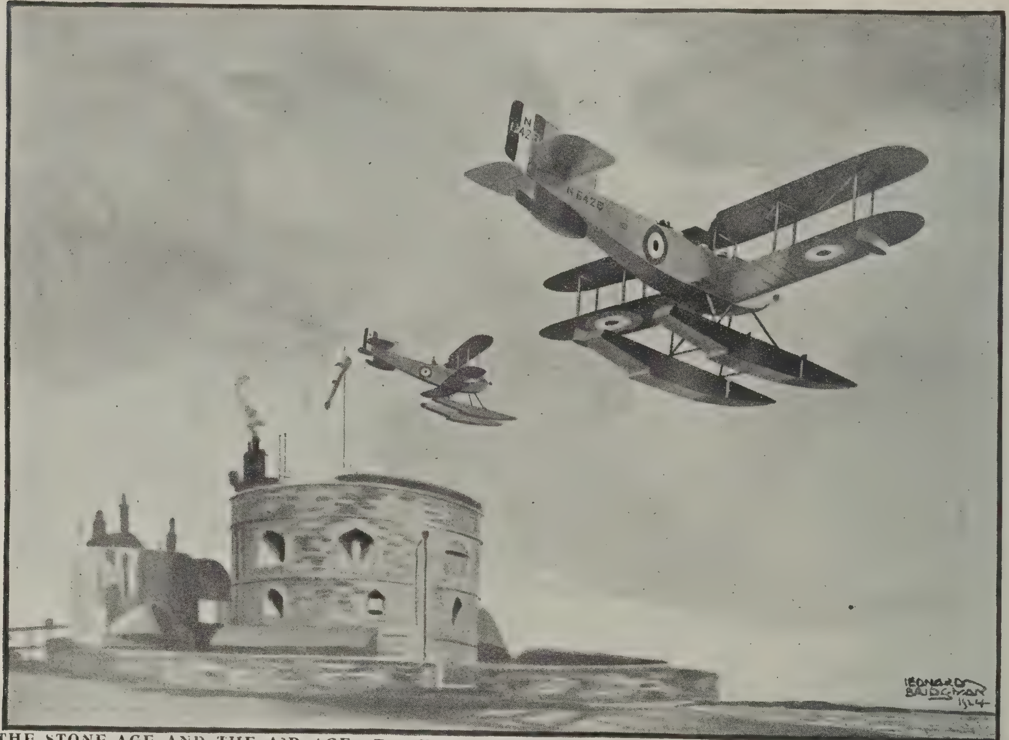
Beal :—Killed on a Service machine at Manston after giving up civilian flying and rejoining the R.A.F. The machine, a twin-engined bomber, stalled and dived. Two mechanics who were passengers were also killed.

Bird :—An R.A.F. officer killed while testing an experimental fighting machine at Martlesham. He held a civilian licence so that he might while on leave fly a civilian aeorplane to and in Sweden. A mechanic was killed with him.

Bush :—Killed while "stunting" with a passenger on an old joy-ride machine in South Wales. The owner of the machine was killed with him.

Castleman :—Killed at Northolt as pilot of an experimental twin-engined machine which spun into the ground. Four passengers were killed.

Douglas and Ross :—Two Australians, formerly in the R.A.F. Killed through their machine, which was very heavily loaded, diving uncontrollably into the ground at Kingston-



THE STONE AGE AND THE AIR AGE.—Two Fairey IIIDs., Rolls-Royce Eagle engines—our newest First Line of Defence—flying over the old Martello Tower known as Calshot Castle, one of the chain of stone defences built against a possible invasion by Napoleon Bonaparte.

on-Thames shortly after they had left Hounslow (a few miles away) in an attempt to fly to Australia.

Foot :—Killed in the Grosvenor Cup Race 1923 through a wing breaking in the racing monoplane which he was flying.

Forson :—Killed in the Pyrenees while taking a machine to Madrid. Flew into the mountain-side in low clouds. May be ascribed to excess of keenness to do his duty by his employers.

Griffiths :—Spun into the ground when testing a single-seat fighter at Coventry.

Hawker :—Killed while testing a racing machine. Evidence is divided as to whether he died in the air owing to an internal lesion or whether the machine caught fire in the air and crashed in landing.

Howell :—An Australian, formerly in the R.A.F. Drowned close to the coast of Greece while attempting to fly to Australia. Descended in the sea because he was lost in the dark and apparently did not care to risk landing on a rocky coast. His mechanic was drowned with him.

Keys :—Stalled and dived into the ground while testing a big passenger-carrying machine. The engine showed signs of failure and he tried to turn back to the aerodrome. One mechanic passenger was killed with him and three escaped.

Kilby :—Killed while flying in Japan. Circumstances unknown.

Lee (Brigadier-General) :—Killed at Weston-super-Mare while flying a joy-ride machine. Apparently stalled while coming in to land on the sands.

Ortweiler, Milne and Richardson :—Killed in one machine piloted by Mr. Richardson owing to an error of judgment while "stunting" at a Spanish Military aerodrome near Madrid.

Riley :—Stalled and crashed owing to engine failure at Bedford.

Sadler :—Killed at Peterborough as pilot while looping an old "joy-ride" machine of which he was the owner. The machine was dangerous through old age and bad maintenance.

Shepperson :—Killed in the United States through touching a tree with one wing-tip while "stunting" on the machine which he had been using for smoke-writing in the sky.

Smith (Sir Ross) :—Killed at Brooklands in a spinning nose-dive through stalling the amphibian flying-boat on which he was about to attempt to fly round the World. Accident obviously caused by unfamiliarity with the type. His mechanic was killed with him.

Sperry :—An American pilot holding a temporary British certificate. Drowned near Rye in Sussex. Descended into the sea owing to engine failure and tried to swim ashore. Machine was retrieved undamaged.

Tebbitt :—Killed at Hamble while trying to reach the aerodrome with a failing engine. Machine stalled and dived.

Miss Trafford :—Had qualified for an aviator's certificate. Killed as passenger with Mr. Castleman.

There is as complete a list of fatal accidents to civilian pilots as it seems possible to obtain. It will be seen that—again subject to the proviso that no aeroplane ought to stall and dive or spin—nobody in particular was to blame for most of the accidents except the unfortunate pilots themselves. While one would hesitate to charge any of them with actual carelessness, there is no doubt that nearly all the accidents might have been avoided by the exercise of greater caution.

In some cases the actual design or construction of the machines made very great caution advisable, and it is to be hoped that designers in general have profited by the sacrifice of the lives of the pilots. Also it is to be hoped that the air-line pilots of the future, whether new or old, will learn the lesson that familiarity with the air must not be allowed to breed that contempt which is at the bottom of all carelessness and is the cause of so many accidents, fatal and otherwise.—C. G. G.

THE GLOBE TROTTERS.

Major MacLaren's Stop.

The spare Napier engine for Major MacLaren's machine was received by him at noon on April 14. By the time these notes appear he should have resumed his flight.

The suggestion that the stoppage was due to a sympathetic strike with the British pilots at home is discountenanced.

The American Expedition.

On Apr. 7 the fourth of the Douglas "World Cruisers" arrived at Prince Rupert Island from Seattle so that the whole of the expedition have now completed the first stage of 650 miles.

The damage to the undercarriage struts on Major Martin's machine as reported last week has caused further delay but on Thursday Apr. 10 the four machines left for Sitka, Alaska, where they arrived later on the same day. On Apr. 13 they were reported to have arrived at Seward, Alaska from Sitka so that it would appear that Major Martin's "Hoodoo" has succumbed to the cold of the Great North-West.

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Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Britanicos.

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéreos.

Diseñadores y constructores de hidroaviones, barcos, aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de aparatos especialmente adecuados para el levantamiento de cartas topográficas y fotográfias, hangares flotantes y completo equipo para estos mismos.

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THE WAY OF THE ROYAL AIR FORCE.

By C. G. Grey.

Somewhere back in the dark ages of aviation somebody of some political significance remarked that the Royal Flying Corps (which then had its Naval Wing and its Military Wing) was always on active service although the Nation was at peace. Since those days most of the people who count for anything have seen so much of active service themselves that they are a trifle apt to forget that the Royal Air Force (which once more does the air work of the Navy and Army as well as its own job) is still continuously on active service not only against the King's enemies but in that prolonged war against the atmosphere and the force of gravity which the poetically-minded used to call "The Conquest of the Air"—a comprehensive phrase which still survives as the title of an excellent aeronautical newspaper produced in Belgium.

Every now and then the War Office publishes official dispatches relating in that faultless unemotional yet graphic language which is the peculiar product of the General Staff the chief features of the spasmodic wars which the Army wages at odd places on the frontiers of the Empire. The Navy, having even less real fighting to do now than it had during the 1914-18 period, sends bits of itself cruising round the World "showing the flag" as it is called, and. with that talent for advertisement which is as typical of the self-styled Silent Service as is soldierly reticence of the Army the Admiralty sees to it that the hearty sailorman's doings are made known to the British taxpayer. But of the Air Force one hears little that is good,

Frequently Members of Parliament who know better, and pretend that they do not, rise in the House and attack the R.A.F. by questions or in speeches suggesting that the sole function of the Service aviator is to bomb innocent tribesmen whose only offence is that they share with the British workman and the British capitalist a rooted objection to paying taxes. Strange tales are told of the blowing-up of defenceless villages and of the shooting-up of flocks and herds. A Secretary of State or an Under-Secretary or a Parliamentary Secretary replies that the charges of inhumanity are groundless. But nobody ever explains just why it has been necessary to send a few aeroplanes to bomb some murderous gang or to intimidate some warlike tribe which has been raiding one or other of our friendly tribes who are conscientious objectors to War because they are too weak or too fat to fight.

The Decorative Method.

In the old happy days the War Office used to send a brigade or two against such offenders and call it a Field Force. A few men used to be killed and everybody got General Service Medals. If the control of the campaign were particularly incompetent—as was customary if the Government of India and not the War Office were concerned —a minor disaster occurred and a much bigger Field Force was sent to clean up the mess. Then the frontier brawl became a Campaign. And if that in turn produced a worse disaster—with the help of the Great Ones at Simla it was always possible—it became a War and the Field Force became an Army. And then special medals were given and people were promoted in batches and K.C.M.G.s and D.S.O.s and C.S.I.s and suchlike decorations were handed out on trays.

Parenthetically one may observe that medals are only struck for what during the Boer War were called "regrettable incidents." If a Frontier Force in India or a little military detachment in East or West or Central Africa or the Soudan or at Aden does its job efficiently and controls its area without serious fighting and has no casralties it merely gets malaria instead of medals. But if it gets into a first-class mess and has itself cut up by Wazirs or Fuzzies and has to be rescued or avenged by strong forces then everybody is decorated heavily all round. Which is thoroughly unjust but precisely the way of the World in war and commerce and everything else.

That being so it is perhaps natural that little should be heard of the R.A.F.s doings for it has little opportunity for disasters on a big scale. The scandal of the bad equipment of the R.A.F. in India created some little stir for a while, and eventually the blame was fixed where many of us knew it belonged namely on the Government of India, which has been responsible for all India's military disasters such as the first Afghan War, when one man on a weary pony got back to Jelalabad out of a force of 40,000, and the disgraceful Burmese War, and the lamentable affair at Maiwand.

But people in England are too well accustomed to flying officers being killed in accidents at home to trouble their heads about a few extra deaths through bad aircraft in India. And as there was no political capital to be made out of these incidents our politicians did not trouble about it either. Besides, the Air Ministry itself, after much wrestling with the Government of India, had started to put the trouble right and had sent a thoroughly competent senior officer to tackle the problem on the spot before the existence of the scandal became known in England.

When the R.A.F. is actually operating against troublesome tribes the worst that can happen to it is the loss of one or two machines in enemy territory either through forced landings or through a pilot coming so low in an attack that he or his machine is hit by rifle fire at short range. A disaster worthy of the name could only occur if some very strong tribe captured an aerodrome. and that is practically impossible even on the North-West Frontier of India or in Northern Iraq, for the aerodromes are seldom less than fifty miles from the place to be attacked and they are generally a good deal more. And the system which Sir Samuel Hoare so well described as "control without occupation" works so well that even advanced landing grounds are well outside the enemy's reach.

Which will explain why the R.A.F. can hardly expect to have a real war of its own which will produce special medals and dispatches and general promotions. The best it can expect is the odd D.S.O. or D.F.C. for individually good work and special promotion for good leadership or good organising work.

The R.A.F. Way.

Nevertheless the R.A.F. does come in for some quite exciting times and does do some extremely good work But because there is no definite beginning or end to its campaigns there is no opportunity for publishing official dispatches about them. So all that one hears about the Air Force on active service comes from gossip in Clubs and places where aviators meet or from letters at second hand from people over-seas. And these odds and ends of stories are distinctly interesting and frequently amusing.

Apparently one of the common incidents of the day's work in Iraq is to be brought down by engine-failure in the desert. When this happens during a journey over a peaceful area it is sufficiently uncomfortable for it may mean waiting for days before being discovered and rescued by another aeroplane sent out in search of the missing machine. The officially friendly Arab is not above committing a quiet murder for the sake of what he can catch. Though in these days the tribes along the routes frequented by aeroplanes generally have enough sense to know that the profit to be got out of such a murder is not worth the subsequent retribution there may always be ordinary brigands and bad hats somewhere in the vicinity who do not belong to the local tribe. Such murders happen even near Headquarters, for it will be remembered that two non-flying officers of the R.A.F. were murdered only a few months ago just outside their camp when returning from an evening in Baghdad.

Where the real excitement comes in is when a machine is forced to land, either by engine failure or because it has been hit, close to a place which it has been attacking. There is one officer at present in England who has twice been brought down under these circumstances. On each occasion he was seen to land and each time another machine landed and picked him up under rifle fire from the enemy. Once at least he came back lying full length on the top of the lower plane of the rescuing machine holding onto the inner interplane strut, because his observer occupied the only available space in the observer's cockpit. And after the second effort somebody who did not like him much asked the rescuing pilot why he brought him back,—which is very much the type of humour which was typical of the pre-war and wartime Flying Services.

After all it is natural that being still at war the R.A.F. should maintain its war-time spirit, and it seems to be particularly the case in Iraq which Air Marshal Sir John Salmond has just left to take over the command and organisation of the Home Defence Area. As one enthusiastic young officer put it in a letter home. "Really the spirit of the old and dear R.F.C. is to be found in every nook and corner. You know what that means. Everyone is full out."

An Unpublished Dispatch.

A certain incident which may perhaps be told now though it would have certainly have been inadvisable to do so at the time goes far to account for this "full out" spirit of the old R.F.C., on the principle that example is better than precept. It concerns the proceedings which it was necessary to take against a truculent old gentleman named the Shaik Mahmood who, although of good Nordic ancestry like all true Kurds, has a rooted dislike to the English and is in consequence a very dangerous enemy. He has a lair in the Kurdish Hills where he reigns supreme over a tribe of very useful fighting men. And it became necessary to show him the way to peace either by blowing him to Paradise or by proving to him that war would not be a paying proposition for him.

Sir W. G.

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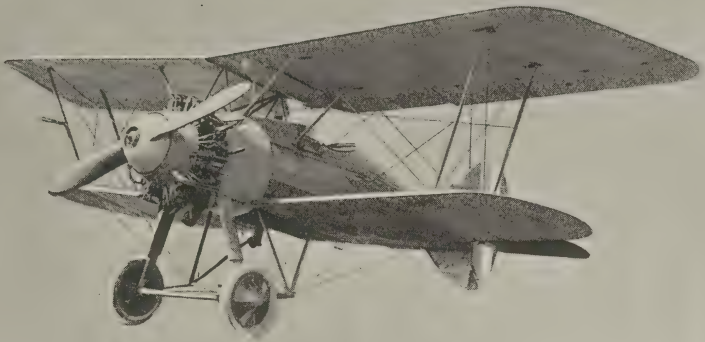

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Therefore on a certain day several machines largely populated by senior officers flew over to Mahmood's residence to help teach him his lesson. And, presumably because he wanted to see for himself precisely the conditions of the case, Sir John Salmond, Air Officer Commanding all British Forces in Iraq, went with the expedition piloted by an officer, who is known from Mosul to Mohammerah and from Cairo to Kirkuk as John-Willie. Doubtless Shaik Mahmood would have felt honoured if he had known the importance of his chief visitor, but it has ever been Sir John Salmond's habit to go and do himself whatever he expects to be done by those under his command.

In due course the formation arrived over the enemy's home, bringing with them by way of souvenirs a few of the very best of those modern commodities known as five-hundred-pounders. And just over the target the engine of one of the machines performed the feat which is generally called "packing-up," so that the pilot had to land just outside Shaik Mahmood's lair.

The Air Marshal's machine and another carrying a squadron leader who is now a wing commander promptly went down to the rescue. The squadron-leader picked up the mechanic of the smitten machine and the pilot, a flying officer, came back sitting on the Air Marshal's knee. One has heard during the War 1914-18 of a guest-night at an R.F.C. Brigade Headquarters at which a junior subaltern sat on the head of a Brigadier-General but never till this incident occurred has one heard of a junior flying officer sitting on an Air Marshal's knee.

A couple of miles back on their homeward route the crews of these two machines saw two of the other machines, one piloted by a squadron leader and one by a flight lieutenant picking up the crew of a third, consisting of a flying officer and a mechanic, who had been forced to land on boggy ground. How they all landed without turning over was a mystery. And naturally the overloaded rescuing machines had some difficulty in getting off again. But all the personnel returned safely to their aerodrome.

Nothing was ever said about the affair officially and one believes that official ignorance on the subject is still immense. But as so many people know of it unofficially no great harm can be done by telling a few more, because it does at any rate illustrate the spirit of the R.A.F. in Iraq.

(*To be continued.*)

The Royal Aero Club Racing Fund.

The racing fund of the Royal Aero Club has received a gift of £1,000 from Mr. Samuel Samuel who is a director of Shell-Mex Ltd. The gift is for the purpose of encouraging air races and it is hoped that it will be used for increasing the very meagre prizes given for the Aerial Derby, the premier British speed race of the year.

More Exhibits at Wembley.

It is interesting to learn that in addition to the aircraft exhibits at the British Empire Exhibition at Wembley which were mentioned in a recent article in this paper Armstrong Whitworth Aircraft Ltd. and Armstrong Siddeley Motors Ltd. will both be strongly represented. A working example of the Jaguar engine, sectioned so that the moving parts can be seen in operation, is to be exhibited on the Air Ministry stand. In addition a Siskin biplane and a Lynx and a Jaguar engine are being shown on the stand of Sir W. G. Armstrong Whitworth and Co. Ltd., in the Palace of Engineering. These exhibits are bound to be of exceptional interest to all who are concerned with aviation.

Tempora Mutantur

Grahame-White Co. Ltd. :—Dr. L. Honeyman, of 18, St Swithin's Lane, E.C., was appointed Receiver (with powers of management) on February 28, 1924, under powers contained in indentures dated November 12, 1915, December 19, 1917, and March 2, 1918.

A Political Acceptance.

The Morning Post of April 11 states :—

> At a general meeting of the members of the Stratford Conservative Association, Captain H. H Balfour was unanimously adopted as the prospective Conservative candidate for the Stratford Division of the Borough of West Ham.

It will be remembered that Flt Lt. H. H. Balfour, M.C., was Personal Assistant (Aide-de-Camp) to Air Vice-Marshal Sir John Salmond, Commanding the Inland Area until Sir John went to Iraq.

Two New French Records.

On Apr. 4 Quartier-Maître René of the Naval Base at St. Raphael reached a height of 3,300 m. (10,824 feet) on a Farman Goliath seaplane carrying 1,000 kgs. (one ton) of useful load.

Previous records for height with 500 kgs. and 1,000 kgs. useful load in Class C *bis* (seaplanes) were held by Lieut. Fuller, U.S.N., F.5.L. flying boat (two 400 h.p. Liberty engines), 2,542 m. (8,337.76 feet) and Lieut. E. E. Dolecek, U.S.N., F.5.L. flying boat (two 400 h.p. Liberty engines), 2,432 m. (7,976.96 feet) respectively.

The R.A.F. Club.

The Annual General Meeting of the R.A.F. Club will take place on Monday, Apr. 28, at 5.30 p.m.

Air Affairs in Parliament.

AERODROMES.

In the House of Commons on Mar. 26, the Under Secretary of State for Air in a written answer to a question by Sir E. Hume-Williams said that it had been decided to re-acquire a number of War-time aerodromes. The suitability of location in regard to defence requirements was however more important than the acquisition of aerodromes in which the buildings were still standing. Tangmere and Filton had already been re-acquired, the others had better not be named during negotiations for purchase or lease.

AIRCRAFT CARRIERS.

In the House of Commons on Mar. 26, in reply to a question by Capt. Viscount Curzon, the Parliamentary Secretary to the Admiralty (Mr. Ammon) said that three aircraft carriers were now completed for service and were in commission. The equipment of each carrier varied according to type and number of machines and each carrier had her full flying equipment.

THE AIR ROUTE TO INDIA.

In the House of Commons on Mar. 27, Lieut.-Commander Kenworthy asked the Under Secretary of State for Air whether owing to the delay in the airship service to India, the mail route could not be taken in hand by the R.A.F. or by commercial aeroplane companies. The Under Secretary of State for Air (Mr. Leach) said that research was being carried on in connection with the development of types of aircraft and engines suitable for air mail work. The establishment of a heavier-than-air service to India would not be justifiable in view of possible airship developments.

Lieut.-Commander Kenworthy called attention to the fact that a number of aircraft belonging to the R.A.F. habitually carried mails, and Brigadier-General Spears referred to an offer made by the Daimler Co. to co-operate in carrying the mails.

CADETS

In reply to a question by Lieut.-Commander Kenworthy on Mar. 27, the Under Secretary of State for Air said that there was no air cadet colleges in France, America, or Japan. Officers entering the French Air Service passed through the Army Schools at St. Cyr and the Ecole Polytechnique. In Japan and the United States of America officers were selected from the Army and Navy and underwent air training at their respective Army and Navy air training stations.

AIRMEN'S MARRIED QUARTERS.

In the House of Commons on Mar. 31 Mr. Greene called the attention of the Minister of Health to the fact that 30 houses at Norton the leasehold of the Air Ministry were being used to accommodate the families of married airmen although there was no aerodrome within 30 miles. Mr. Wheatley replied that the houses were being used to accommodate the families of married airmen serving overseas and that he did not propose to interfere with this arrangement. These families had been occupying quarters on active aerodromes which were needed for men serving there.

DOCKING ACCOMMODATION AT SINGAPORE.

In the House of Commons on Apr. 2 Viscount Curzon offered an unreserved apology to the Parliamentary Secretary to the Admiralty for his statement that Mr. Ammon had made an incorrect statement regarding the docking accommodation at Singapore to the House of Commons on the Navy Estimates. H.M. Ships Furious, Hermes, Argus, Glorious and Courageous could all use the present dock.

THE FURNISHING OF SMALL WARS.

In the House of Commons on Apr. 3 Mr. MacLean asked the Home Secretary whether the Aircraft Disposal Syndicate had for disposal 2,000 complete aeroplanes, 10,000 new aeroplane engines and 8,000 Vickers and Lewis machine guns (air type) and whether he was aware that several parties were endeavouring to purchase these armaments; and whether before they were allowed to be sold or leave the country, he would insist upon guarantees as to their destination and that they would not be used for illegal purposes. Mr. Graham replying for the Home Secretary said that he had no information as to the quantities remaining for sale or as to what negotiations were proceeding As regards the machine guns these might only be sold after full and satisfactory particulars had been furnished to the Government.

THE FLEET AIR ARM

In the House of Commons on Apr. 3 in reply to a question by Viscount Curzon, the Parliamentary Secretary to the Admiralty said that if the two seaplane carriers Ark Royal and Pegasus were included the Navy would possess eight aircraft carriers when H.M.S. Glorious and H.M.S. Courageous were completed. The 400 aeroplanes mentioned in the question were considerably in excess of the number of aircraft that these vessels would be able to accommodate. Excluding reserves, 100 machines were approximately the number allocated to the Navy. Arrangements had been made for the provision of the number of aircraft necessary in the near future in view of the accommodation that would become available. It was not intended to pass aircraft carriers into service without their establishment of machines.

EXPENDITURE ON AIRCRAFT.

In the House of Commons on Apr. 10 Lieut.-Col. Moore-Brabazon in three questions asked the Under-Secretary of State for Air whether, in the Air Estimates for 1923-24, £5,594,000 was allocated for technical and warlike stores, £940,800 for aero-engines and £1,913,400 for complete engines; how much of each of these sums was actually expended and to what purpose the surplus has been applied. The Under Secretary of State for Air said that in each case the provision has been overspent.

[One would like to know how much of the money has actually been paid to aircraft constructors and whether goods have been delivered in accordance with regulations for the money paid.—Ed.]

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EXHIBITORS IN THE PALACE OF ENGINEERING,
BRITISH EMPIRE EXHIBITION.

THE ROYAL AIRFORCE.

London Gazette.

Apr. 8.

General Duties Branch.—The follg. are granted perm. commns. in the ranks stated with effect from the dates indicated:—Sq. Ldr. W. H. de W. Waller, A.F.C. (Apr. 9); Flg. Off. W. N. Plenderleith (Mar. 24).

The follg. are granted S.S. commns. as Flg. Offs., with effect from, and with seny of, the dates indicated:—A. Haines (Mar. 27); H. J. Gearing (Apr. 1).

The follg. are placed on half-pay, Scale B (Mar 25):—Sq. Ldr. A. S. C. Maclaren, O.B.E., M.C., D.F.C., A.F.C.; Flg. Off. W. N. Plenderleith.

Flt. Lt. B. J. W. Brady, D.S.M., is restd. to full pay from half-pay (Apr. 3); Flg. Off. H. A. Argles resigns his S.S. commn. (Apr. 9); Flg. Off. J V Ould relinquishes his S S commn. on acct. of ill-health, and retains his rank (Apr. 9); Plt. Off. W. T. D. Windham relinquishes his S.S. commn. on acct. of ill-health contracted in the service (Apr. 9).

Stores Branch.—Flg. Off G. Bucknall resigns his S.S. commn. (Apr. 9); Flg. Off. R. Blackith relinquishes his S.S. commn. on acct. of ill-health, and retains his rank (Apr. 9)

Reserve of Air Force Officers.—The follg. Flg. Offs. on probn. are confirmed in rank with effect from the dates indicated:—J C Joynt (Mar. 18); C. T. Holmes (Apr. 8).

Appointments.

Week ending Apr. 14.

General Duties Branch.—Squadron Leader Tomkinson, D.S.O., A.F.C., to H.M.S. "Pegasus," to command R.A.F. Unit, 21/3.

Flight Lieutenants G. E. Ranson, to No. 24 Sqdn., Kenley, 23/4; G. E. Livock, D.F.C., to H.M.S. "Pegasus," 21/3; C. A. Ridley, D.S.O., M.C., to No. 3 Sqdn., Manston, 14/4; P. B. Hunter, to No. 14 Sqdn., Palestine, 4/4; F. H. Laurence, M.C., to No. 2 Wing H.Q., India, 13/3; T. A. Langford-Sainsbury, A.F.C., to No. 208 Sqdn., Egypt, 1/4; E Burton, to No. 28 Sqdn., India, 7/3.

Flying Officers E. J. Spearing, to Marine Aircraft Exper. Estab., Felixstowe, 14/4; (Hon. Flt. Lt.) E. L. O. Baddeley, (Hon. Flt. Lt.) K. M. Murray, R. L. Yates, to Aircraft Depot, India, 5/3, C. A. Elliott, to School of Photography, S. Farnborough, 7/4; D. R. Sharman, M.C., to No. 56 Sqdn., Biggin Hill, 23/4; C. Rose, to R.A.F. Depot, on appointment to a S.S. Commn., 7/4; E. P. M. Davis, A.F.C., A.M., F H. Isaac, D.F.C., L. Martin, A. R. Wardle, A. J. Rankin, H. A. Dinnage, and L. D. Stewart, all to H.M.S. "Pegasus," 21/3; A. Lanman, A.F.C., to remain at Martlesham; H. K. Goode D.S.O., D.F.C., to No. 1 School of T.T. (Boys), Halton, 7/5.

Medical Branch.—Flight Lieutenant (Medical) T. L. P. Harries, M.B., to R.A.F. Depot (Non-effective Pool), 14/3; J. J. Clarke, to H.Q., India, 4/4. Flying Officer (Medical) W. J. Hutchinson, M.B., to H.Q., India, 4/4.

Stores Branch.—Flight Lieutenant (Stores) W. Thorne, to H.Q., Palestine, 2/4. Flying Officer (Stores) H. N. Stevens, to No. 1 Stores Depot, Kidbrooke, 1/5; G. W. Sturman, to H.Q., Cranwell, 2/5; W. H. Bowden, to No. 17 Sqdn., Hawkinge, 21/4; F. A. Skoulding, to Boys' Wing, Cranwell, 23/4; A. J. Redman, D.F.C., to H.M.S. "Pegasus,' '21/3. Flying Officers (Accountants) W. W. Deane, to No. 12 Sqdn., Andover, 24/3; R C. Clayton, to No. 2 Sqdn., Manston, 24/3; C G. Bull, to School of Balloon Training, Larkhill, 11/4.

The R.A.F. Staff College.

The following officers are all posted to the R.A.F. Staff College, Andover, for Staff Course (No. 3) (May 5):—

Wing Commanders.—J. T. Babington, D.S.O.; A. B. Gaskell, D.S.C.

Squadron Leaders.—A. C. Maund, C.B.E., D.S.O.; T. W. Mulcahy-Morgan, M.C.; T. E. B. Howe, A.F.C.; R. Collishaw, D.S.O., O.B.E., D.S.C., D.F.C.; N. H. Bottomley, A.F.C.; F. H. M. Maynand, A.F.C.; C. J. Mackay, M.C., D.F.C

Flight Lieutenants.—E. M. Pollard; G. C. Pirie, M.C., D.F.C.; J. C. Slessor, M.C.; L. G. S. Payne, M.C., A.F.C.; J. P. Coleman, A F.C.; T W. Elmhirst, A.F.C.; J. W. B. Grigson, D.S.O., D.F.C.; C H. Keith; P. F. Fullard, D.S.O., M.C, A.F.C.; J. H. Green; L. N. Hollinghurst, D.F.C.; C. J. S. Dearlove.

Air Marshal Sir John Salmond.

The Times correspondent in Baghdad in a communication dated Apr. 7 states that Air Marshal Sir John Salmond left Baghdad by air for Cairo on that date. Aeroplanes from every squadron in Iraq formed an aerial guard of honour for the first part of the flight.

The R.38 Memorial.

The monument erected in the Western Cemetery at Hull in memory of the 44 officers and men of the Royal Air Force and of the United States Navy and others who were lost in the airship R.38 in August, 1921, was unveiled on Apr. 11.

The memorial is a Celtic cross in Portland stone 18 feet high, with plaques bearing the names of the victims. In the centre is a bronze with the inscription:—"To the glory of God and in memory of the officers and men of the Royal Air Force and of the Rigid Air Detachment, United States Navy, members of the staffs of the National Physical Laboratory and of the Royal Airship Works, lost in the airship R.38 (Z.R.2), August 24, 1921."

The memorial was unveiled by Air Vice-Marshal Sir Vyell Vyvyan, Air Officer Commanding Coastal Area, R.A.F., and was dedicated by the Bishop of Hull, assisted by the Rev. H. D. L. Viener, Chaplain-in-Chief to the R.A.F. A detachment of the R.A.F. formed a guard of honour.

The North West Frontier Province.

The Times correspondent writing from Simla on April 9 states:—

On Monday three aeroplanes of the R.A.F. flew over Chitral as a friendly visit. After their return to their station the air authorities received a cordial congratulatory telegram in the name of the officials and people of Chitral on the first arrival of aeroplanes over Chitral, and expressing the hope that it may be the forerunner of many more such visits. The political effect of the flight is stated to be excellent.

The W.R.A.F. Dinner.

The Old Comrades' Association of the W.R.A.F. held their first annual dinner on Apr. 5 after the annual general meeting. Dame Helen Gwynne-Vaughan, formerly Commandant, was in the chair and the guests were: Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Miss Davy (Q.M.A.A.C.), Miss Matheson (W.R.N.S.), Mr. Howarth (United Services Fund), Colonel Heath, Secretary of the British Legion, and Mr. J. P. Cunninghame, Assistant Secretary of the R.A.F. Memorial Fund There were about 120 present.

Following the toast of the King, Mrs. Pratt-Barlow proposed Our Guests, Miss Davy and Col. Heath replying. Miss Davy said the W.R.A.F. became quite a good show after it was whacked into shape by the senior Services. Colonel Heath said that all ex-W.R.A.F.s were entitled to full membership of the British Legion.

Dame Helen Gwynne-Vaughan, proposing The Air, associated with it the name of General Sir Sefton Brancker. She said that this first annual dinner was a birthday party in more ways than one. It was the nearest Saturday to Apr 1. On Apr. 1 1918 the R.A.F. and W.R.A.F were born, the original Air Battalion, R.E., came into being on Apr. 1 1911 and the R.F.C. came into being early in Apr. 1922.

Dame Helen read a letter she had received from the Chief of the Air Staff in which he referred to his appreciation of the work of the W.R.A.F. and wished the Association the best of luck.

Dame Helen said that the tradition of the Air Force had been forged under stress of war and was a tradition of calm and courage in emergency which did not disdain laughter in the intervals of work. No tradition is complete without a ghost, and the R.A.F. did not lack a ghost. Proud of its triumphs, glorying in its development, waiting to serve it again is the ghost of its disembodied little sister, the W.R.A.F.

Replying to the toast, General Sir Sefton Brancker said that he felt almost as shy as he did in the early days of the W.R.A.F. when he was told to say a few words to a room full of young officers of the W.R.A.F. He was about the first senior officer to have a lady driver and a very brilliant driver she was too; she afterwards rose to the rank of Lt.-Col. He said that he had always had a very weak spot for the W.R.A.F. although they got him into the deepest bit of trouble he ever fell into. Within four days of his appointment as Master-General of Personnel he had landed himself and Lord Weir into a real *cause célèbre*. However, believing in drastic measures when things were wrong, he took prompt action and out of the storm arose their Commandant, one of the very best officers he had ever had the pleasure and honour to command.

She ruled him with a rod of iron so far as the affairs of the W.R.A.F. were concerned. Her magic touch set everything running sweetly and she certainly saved his reputation. Dame Helen might become an M.P. in the future and if so she ought to make a very good Secretary of State for Air.

Regarding the Royal Air Force General Brancker said that he had really no right to speak on their behalf as he had been out of the Service for five years. But lately he had been gazetted an Air Vice-Marshal in the Reserve which incidentally gave him a complete alibi as he was now General Sir Sefton for social purposes and Air Vice-Marshal Sir William officially.

He thought he could say that the Air is very well and very strong thank you. The R.A.F. had at last got its long postponed increase which had made everything look up and had given a special stimulus to the designers and manufacturers. We should probably have a Two-Power Standard before we had finished.

With regard to his own particular fad, Air Transport, General Brancker said that matters were beginning to move. He said that they had induced some real BIG (all in capitals) business men to take charge and they were determined to get aviation down to real business principles. A Federation of British Civil Air Pilots had been inaugurated and had created a passable imitation of a good hearty British strike. Air Transport could now be considered a commercial proposition!

Airships, he thought, were all right and on the previous day he had promised the Japanese Ambassador that in three years' time we should be able to take him by air to Japan, or half-way.

General Brancker pointed out a fact which he said was quite obvious but did not often strike people at once namely that military aviation was bad for the British Empire and that air transport was good; military aviation had laid our country open to direct attack whereas air transport would keep us in close touch with our overseas Dominions, colonies and dependencies and so very appreciably strengthen our great Empire in the future. But we had to face the military difficulties, and we must have an Air Force second to none.

He went on to say that in looking back he felt very sincerely that the R.A.F. in particular and aviation in general owed a deep debt of gratitude to the W.R.A.F. for their services during the War. He personally had seen a good deal of them and he could give the W.R.A.F. the palm for enthusiasm, loyalty, endurance under rough and difficult conditions and great *esprit de corps*, a grand example in many respects to the men.

He wished them all the best of luck and hoped the country would be fortunate enough to make use of their services in the next great crisis—from the word "Go"—right at the beginning and he knew that they would not fail. So he called on them to raise their glasses and drink the health of the Old Comrades' Association of the W.R.A.F.

Miss George replied on behalf of the Association. Unfortunately one was at the Salisbury Plain table, too far away to hear.

Miss Forster in thanking the President asked her to tell the Chief of the Air Staff that the W.R.A.F. were standing by until they were needed again. She added that she personally would like to make out a few less nominal rolls in the next war and be allowed to drop a few bombs.

Husbands and other mere men then joined the company and a very cheery dance began and went on till midnight.

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'IT is surely of practical significance that Rolls-Royce engines, to take one British example, have since October, 1922, flown 278,000 miles, carried 5,077 passengers, and caused not a single injury or loss of life.'

Saturday Review, 1/9/23

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OF THE DIRECTING OF RESEARCH.

BY W. H. SAYERS.

At midnight on Mar. 31 the office of Director of Research at the Air Ministry officially ceased to exist and its place was taken by a Directorate of Technical Equipment and a Directorate of Scientific Research. At the moment of writing no official notice of the definite appointment of either a Director of Technical Equipment or a Director of Scientific Research has been made by the Air Ministry, but it is a fairly open secret that Air-Commodore F. C. Halahan, C.M.G., D.S.O., M.V.O., C.B.E., is to become Director of Technical Equipment and that all those individuals who have qualifications which fit them for the post of Director of Scientific Research and who so far have been approached by the Air Ministry as potential holders of that position have refused to accept the position on account of the inadequate remuneration which attaches to the post.

In the meantime the duties of Director of Scientific Research are it is understood to be undertaken by a gentleman of very considerable technical abilities, who has a very large experience of administration—as administration is understood in Government offices—and who would undoubtedly be worth the salary now offered to the Director of Scientific Research by the Air Ministry to any commercial firm which had the ability to direct his knowledge into useful channels.

Concerning the appointment of Air-Commodore Halahan as Director of Technical Equipment, it is not possible to express any very definite opinion. He is of course a senior and very distinguished officer of the R.A.F. and one must assume that he knows what the R.A.F. needs in the way of Technical Equipment, and has the necessary authority to see that it gets it—either in whole or in as large a part as the existing state of the British Aircraft Industry will allow. Aircraft after all are still in a very elementary stage of their development and ten years hence it should make very little difference whether the department of D.T.E. is two years behind the times or not.

Importance of the New Department.

But the position of the Director of Scientific Research is another matter altogether. Aeronautical Science at the present moment is in a most interesting and a most critical stage. We are just beginning to find out how little we really know about aeronautics, and the future development of aviation depends very largely upon the progress and the direction of experiment and research in the next few years.

If there were any likelihood that experiment and research in aeronautics the next few years would receive reasonable support from private individuals or commercial undertakings in this country it really would not matter who became Director of Scientific Research. But if as seems to be probable, experimental and research work is to be more and more controlled by the Air Ministry the future prospects for aviation in this country are very hopeless unless the Air Ministry can rise above its present conception of the importance of research and of the value of a competent director of the official Research Department.

As has before been said in these pages it is impossible to draw a hard and fast line between experimental work and research work. It may however be suggested that although one cannot differentiate between the two classes of work it is possible to differentiate between the uses which are made of them. For instance one may test a wing section and obtain a series of figures for the lift drag and moment coefficients at various angles of incidence. The figures so obtained may be used as just so many ascertained facts which will help one to design an aeroplane using that wing section. One is then using the test as an "ad hoc" experiment only.

Or one may take the same figures and use them as experimental data which can be used to check, refute, or to aid one in formulating, a theory of the behaviour of wings generally. In that case the test is used for basic research. The difference is that in one case one is satisfied to know how the wing behaves under certain conditions, in the other case one attempts to discover why it behaves so.

A Mixed Business.

Apparently the Department of Scientific Research is to be responsible for "ad hoc" experimental work as well as basic research. Statistical data of the sort so plentifully to be found in the R. & M.'s issued by the Aeronautical Research Committee are in fairly continuous demand by designers and constructors. They are often of fairly immediate usefulness, they can be manufactured at the N.P.L. and the R.A.F. by routine processes, and there are infinite variations in the shapes of bodies that can be tested and in the conditions of test, without any material addition to our real knowledge of aeronautics. At the best "research" of this type can lead to minor improvements in detail of the present types of aircraft, and the greater part of the experimental work involved could be carried out quite as cheaply and a good deal more conclusively by the designers who need the information as by the official research organisations.

On the other hand research work devoted to attempts to provide a theory of aeronautics—that is to say, to discovering the why of aeronautical phenomenon and not merely the collection of statistics is not and cannot be a routine process. Nobody can guarantee to produce a satisfactory theory as they can promise to provide the results of a wind tunnel test by a given date.

It is not very much use expecting that basic research work started to-day will produce results which will help the designer to build a better aeroplane six months hence. But on the other hand if basic research is neglected it is safe to say that ten years hence we shall still be designing aircraft by a complicated system of trial and error instead of in the light of understanding.

And if the Air Ministry put at the head of the Department of Scientific Research a Technician of the type who is willing to work under more or less Civil Service conditions for a salary of round about £1,500 per annum they cannot reasonably expect that department to resist the pressure that will continually be brought to bear on it by the Directorate of Technical Equipment to produce results of immediate but temporary value and to postpone work which however great may be its ultimate value may and very probably will not produce definite results within a period of years.

There is a very strong case against the Air Ministry touching basic research work at all. If the Air Ministry wishes to encourage research of this type by far the best method of doing it is to make adequate grants to properly organised Universities for research work in aeronautics carried on by the Professors and students at those Universities. It has to be recognised that any money spent in this way is in the nature of an investment which cannot be expected to mature with great rapidity.

Cheap Research.

If however it must have a direct finger in the Research pie it must recognise that the Director of Scientific Research—if he is to justify his high-sounding title—must be a man of a different class to the one that can be hired in the market to submit himself to the trials and vexations of working under the innumerable rules and regulations of a Government office for a salary of £1,500 per annum. There have probably been—at any rate in this country—more competent scientific men whose gifts and abilities could have been of inestimable value to the community but who have starved in garrets than there have been great artists who have suffered a like fate. The trouble is not so much that there are not men of the required calibre who would not be content with a steady income of £1,500 a year, but that work of this kind cannot be carried on with any prospect of success by a man who is rated by his employers as a mediocrity.

It has often been alleged in this country that money spent on research does not bring back any commercial return. This is true largely because the business man and the politician of this country have not realised that research is a very big business indeed, and that an attempt to run research "on the cheap" is practicaly foredoomed to failure. The idea that £1,500 per annum is a fair market price for a man not merely of great technical and scientific knowledge, but also of an original and far-seeing mind, is responsible for the fact that in this country those who call themselves Research workers are very rarely more than technicians devoid of practical ability, who are not worth more than that sum, and that those who really make a success of research work disguise themselves as Consulting Engineers or the like when they are dealing with commercial undertakings, and charge their clients fees that would make the mouth of a successful K.C. water.

Research that Pays.

In America, where whatever else may be the case, enterprise is a fairly common quality and knowledge is regarded as having a cash value, Research workers worthy of the name are valued at something like their real value. As an instance one may mention the General Electric Company of Schenectady. This firm which is among the largest and the richest of the world's commercial undertakings keeps a Research Department which makes many of the largest of British engineering works look like a side show. In charge of this department there are scientists and mathematicians of world-wide repute—and they are paid salaries of almost unbelievable magnitude. These men are not merely super-engineers, they are mathematical physicists in addition, and it is this combination which is needed in a Director of Research if the Air Ministry has any serious intentions of really fostering research.

In fact the Air Ministry would not do badly to offer the job of Director of Scientific Research to Dr. Irving Langmuir, who one believes is the G.E.C. senior research worker at the present time, at his own figure. One does not know quite what that figure would be. If Dr. Langmuir were

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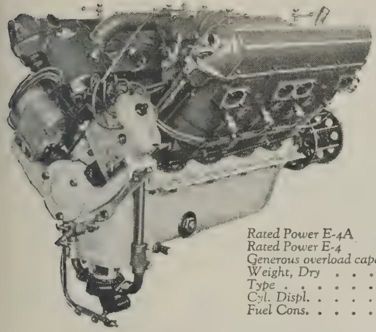

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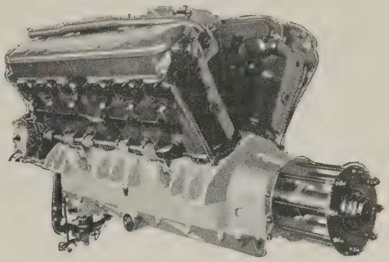
Rated Power E-4	*200 H.P. at 1800 r.p.m.*
Generous overload capacity above rated powers	
Weight, Dry	*480 lbs.*
Type	*8-cyl., 90° Vee*
Cyl. Displ.	*718 cu. in.*
Fuel Cons.	*48 lbs. per H.P. hr.*

250 HOUR DURATION TEST

The E-4 was recently tested by the U. S. Govt. for 250 hours at *full throttle* of over 200 H. P. and 1800 revs. It gained power during this run. The extreme dependability is due to 7 years' development on this size and type. The E-4 is the sixth yearly production model and the E-4A the seventh.

WRIGHT T-3—650 H.P.

Rated Power [*650 H.P. at 2000 r.p.m.*
550 H.P. at 1800 r.p.m.
Generous overload capacity above rated powers
Weight, Dry . . . 1160 lbs.
Type . . . 12 cyl., 60° Vee
Cyl. Displ. . . 1947 cu. in.
Fuel Cons., .45 to .5 lbs. per H.P. hr.
Length 55 3-16″ Width 30 7-8″
Heighth 26 1-4″



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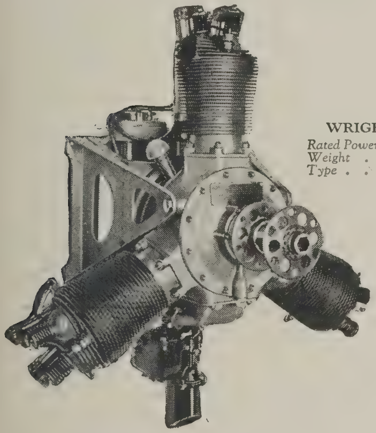

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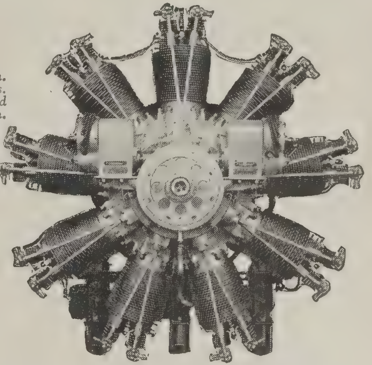
Rated Power, 60 H.P. at 1800 r.p.m.
Weight . . . . . . 175 lbs.
Type . . . . 3-cyl., air cooled

The L-4, a dependable 60 H.P., lightweight engine. A very even torque is obtained. It has been flown on hard tests with the spark plugs removed from one cylinder. Low in cost, it is available for small commercial planes as well as messenger, shipboard and submarine planes.

WRIGHT J-3
220 H.P.

Rated Pawer
220 H.P. at 1800 r.p.m.
Weight . . 442 lbs.
Type, 9-cyl., air cooled
Cyl. Displ. 787 cu. in.



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The J-3 is for use in training planes, shipboard planes, seaplanes and small observation planes. Simplicity, lightweight and ruggedness make this a world's leader for 220 H.P.

WORLD'S SPEED RECORD

H-3 Superfighter, 400 H. P. (Hispano Type). Weight 620 pounds, 8-cylinder, 90° Vee Water Cooled, 1126 cubic inches. F. A. I. world's speed record 500 km. at 164 miles per hour.

THE above five types of engines are all in production and no experimental types are included. Our plant is tooled up to make prompt deliveries on large or small quantities and a few of some types are in stock for immediate shipment. The prices are compatible with new aviation engines built in any other country.

Our Corporation also designs, builds and operates planes. A large staff is employed in cooperating with civil and military airplane designers, manufacturers and operators to incorporate promptly in our engines the recommendations made from flying experience. Enquiries from military, naval and civil sources are solicited.

WRIGHT AERONAUTICAL CORPORATION

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totally ignorant of what he would have to put up with in the employment of a British Government Department he might come over for £15,000 p.a., but if he were reasonably well informed he would certainly ask for twice that sum. And he would be a very profitable investment at that price.

If however the Air Ministry is determined to use cheap labour in its Technical Department and to buy a Director of Scientific Research for the price of a moderately successful grocer, then the British Aircraft Industry will have to realise that the reorganisation of the Department of Research is only an affair of eye-wash and that so far as official encouragement in the development of aviation is concerned they have to go on as best they can in spite of the Air Ministry.

THE BRITISH AVIATION MISSION TO JAPAN.

The lecture on the work of the British Aviation Mission to the Imperial Japanese Navy which was read by Col. The Master of Sempill at the Royal Aeronautical Society on Thursday Apr. 3 attracted a larger audience than one has before seen at the rooms of the Royal Society of Arts.

The paper described in fair detail the work carried on by the Mission, and gave an excellent idea of the organisation of the Japanese Naval Air Service. It also included some interesting technical data concerning the behaviour of aircraft engines and materials under Japanese conditions.

The paper by itself would occupy some 15 pages of The Aeroplane and if illustrated with a reasonably comprehensive selection of the pictures which illustrated it, something like 20 pages, and it is therefore impossible here to do more than to extract from it a few of the more interesting points, and to recommend those who wish for a more complete information to consult the original paper when it is published in the Journal of the Aeronautical Society.

Concerning the Mission itself and its constitution, the most striking characteristic was the very great strength of the personnel on the Technical side. Those who are acquainted with the personality of Col. Sempill will not be surprised at this feature which incidentally may be held to account for the very excellent results which were attained during the course of the Mission's work as marked by the small number of accidents and the excellent behaviour of aeroplanes and engines in service.

The Central Training Station at Kasumigaura consists of a large aerodrome which can be extended from its present area of 700 acres to over double that area when necessary lying close to the shores of a lagoon some thirty miles long by three to four miles wide. The aerodrome is excellently equipped with sheds, workshops and quarters, and on the shore of the lagoon and connected with the aerodrome by an excellent road there is a seaplane station. From the lantern slides of this station which were exhibited it would appear that Kasumigaura has an equipment which could not be equalled by any British air station, the R.A.E. excepted.

At this station all preliminary training both of officers and men in flying and technical work was carried out. Preliminary flying training was on Avros on the Gosport system. It was found that there was little difference between the time taken by Japanese pupils to pass the Gosport course and that taken by British pupils. The general average ability of pilots is high, but the proportion of abnormally good pilots is less than in this country and there is a tendency to indecisiveness on the part of the Japanese when thrown into an entirely unexpected situation. The virtue of courage is developed to the highest extent and the Japanese will go to any length to carry out orders.

A mechanical sense has scarcely developed among the Japanese. They are often oblivious to disquietening noises in engines, but training and practical experience is beginning to have its effect. Technical officers were found to be very keen, but over immersed in theory and inclined to leave all practical matters to their petty officers and men. Here again training and practical example has produced its effect.

The men are keen and hard working—even to the extent of foregoing leave in order to finish a job on which they are engaged. With training they make excellent mechanics.

The machines used in the Japanese Naval Air Service were all of well-known types, and gave results in service up to—if not better than—the average. The "Sparrowhawk" with B.R.II engine is particularly singled out as "the most successful scout training machine so far." Troubles were experienced with the damp but were not serious. No structural failures occurred in the air, and no fires resulted from any crash. Engine failures were very few and mostly confined to the Le Rhône engines used on the Avros. It was found necessary to fit special spinners to the rotary engines in the winter to prevent over-cooling and blocking of the crankshaft with ice. It was also found desirable to lower the compression ratio of the Napier Lion engines to 5/1, as the machines with these engines were usually operated at low altitudes. Wooden airscrews made in this country gave a good deal of trouble, particularly in summer. Leitner-Watts steel airscrews performed extremely well and gave no trouble.

Japan has an enormous variety of indigenous forest trees, which have not yet received the study they deserve as possible aircraft material. Japanese timbers, generally speaking, are remarkably resistant to splitting or decay, and the soft timbers seem superior to European or American equivalents in expansion or contraction with change of moisture content.

Experience with dope in Japan seems conclusively to confirm the superior stability of nitro-cellulose as compared to cellulose acetate dope. A certain amount of dope is manufactured in Japan, but it is not yet up to British standards.

Lacquer was found useful for the protection of steel struts and wires. It is however somewhat heavy and inclined to chip. Experiments with lacquer applied direct to the wood of airscrews have not been altogether satisfactory, but it is thought that a combination of fabric and lacquer will give better results.

There are oil wells in Japan, and a light aviation spirit is produced. It has a low aromatic content—about equal to that of American spirit. Benzol is obtainable, but cannot be relied upon to be sufficiently free from sulphur. It is not considered that native supplies of aviation spirit can keep pace with the demand and aviation petrol to B.E.S.A. specification is imported from Sumatra and Borneo.

Castor oil is produced from Japanese beans, but American oil is imported for aviation purposes. It is not up to B.E.S.A. standard. Mineral oil is obtained from Japanese wells, but no composite oil such as is needed for aero-engines is produced. Oil is imported from Britain.

Japan possesses an Aeronautical Research Committee, founded in 1916, which is attached to the University of Tokio. The committee's Aeronautical Institute with laboratories and wind tunnel was destroyed in the recent earthquake. The same fate befel the wind tunnel at the Naval Air Service Laboratory at Tokio. The Military Air Service possesses the only remaining wind tunnel at Tokorazawa. The value of research work is very fully appreciated in Japan, and progress in this department has been remarkable.

Five companies in Japan are engaged in building aeroplanes or seaplanes and in addition a small number of aircraft are constructed in Naval Dockyards and Military Arsenals. British assistance has been given by Short Bros., who instructed the Naval Aircraft Factory at Yokosuka and a private firm in the construction of F.5 flying boats, and by part of the design staff of the late Sopwith firm who were employed by the Mitsubishi Aircraft Company and who have produced single-seat fighters, two-seat reconnaissance machines and a torpedo carrying triplane Avro 504K and 504L (float type) are also built in Japan.

The 300 h.p. Hispano-Suiza engine is built under license by the Mitsubishi Company, and Le Rhône engines are also in production. Negotiations for the building of other types of engine under license are in hand Salmson engines are built by the Army.

A policy of enlightening the population as to the value of the country's defences is pursued in Japan. Naval Air Stations are open to visitors on one day per week and every town or village in the vicinity sends its quota of visitors of all ages on the appointed day. Even flying-off practices from the decks of ships are nearly always viewed by a limited number of the public and officers are specially detailed to give lectures on flying throughout the country.

The Royal Aeronautical Society.

The Wilbur Wright Lecture.

Lt. Colonel H. T. Tizard, A.F.C., Fellow, has accepted the Council's invitation to deliver the Wilbur Wright Memorial Lecture which will take place at 8.30 p.m. on Thursday, May 29, at the Royal Society of Arts. The subject will be "Fuel Economy in Flight." The R.Ae.S. states that this "will be the twelfth lecture delivered in memory of Wilbur Wright, who died on May 30th, 1912, under the auspices of the Society and the Trustees of the Wilbur Wright Memorial Lecture Fund."

The full list of the previous lectures is as follows:—1913, Sir Horace Darwin, F.R.S.—"Scientific Instruments: Their Design and Use in Aeronautics; 1914, Sir R. T. Glazebrook, F.R.S.—"The Development of the Aeroplane"; 1915, Professor G. H. Bryan, F.R.S.—"The Rigid Dynamics of Circling Flight"; 1916, Mr. Griffith Brewer—"The Life and Work of Wilbur Wright"; 1917, Lt. Colonel M. O'Gorman, C.B.—"Looking Ahead"; 1918, Dr. W. F. Durand—"Some Outstanding Problems in Aeronautics"; 1919, Prof. L. Bairstow, F.R.S.—"Progress of Aviation in the War Period"; 1920, Commander J. C. Hunsaker, U.S.N.—"Naval Architecture in Aeronautics"; 1921, Mr. G. I. Taylor, F.R.S.—"Scientific Methods in Aeronautics"; 1922, Lt. Col. A. Ogilvie, C.B.E.—"Some Aspects of Aeronautical Research"; 1923, Prof. J. S. Ames—"The Relation between Aeronautic Research and Aircraft Design."

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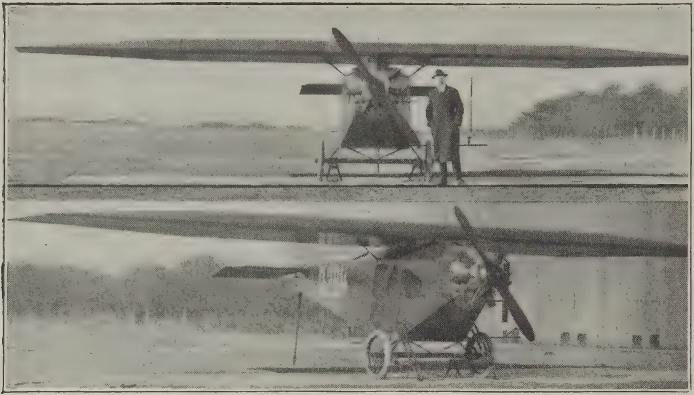

A NEW GERMAN THREE-SEATER.—The Caspar C16 with Siemens Halske 70/80 h.p. air-cooled radial engine. The machine is very similar to the C.L.E.11 Caspar machine shown at the Gothenburg exhibition last summer.

It carries the pilot just behind the wing and accommodates the passengers in a cabin below the wing. The whole machine is of normal wooden construction with metal fittings.

The wings are in three sections, the outer sections being removable from the centre section.

Activities at Southampton.

The Supermarine Aviation Works Ltd. is always an interesting place to visit. Unfortunately, the opportunities of making visits are not as frequent as one would like so that every successive call makes it necessary for one to be prepared to see new sheds, enlarged shops and endless improvements. All this seems to indicate that the Supermarine Co., and Mr. Mitchell in particular, are determined to design "seaworthy hulls that will fly" which are more seaworthy and fly better than ever, and that the Supermarine policy is fully understood by the Air Ministry and certain foreign nations.

On Mar. 25 the first twin-engined amphibian flying-boat was tested out on Southampton Water with success. This boat was designed as a commercial machine for use on the Southampton-Channel Isles service but it has since been acquired by the Air Ministry and it is with tri-coloured rudders and an experimental number that it is being put through its tests.

When the machine first went into the water the engines were run up and the taxying test was started. As the machine was then found to be satisfactory the pilot Capt. H. C. Biard took her straight off the water without returning for any adjustments of any kind. This first test was of 1 hr. 10 mins. duration and the actual time in the air was 45 mins. This must be about the first time on record that any absolutely new type of seaplane has taken the water and the air consecutively on its first trip without any interval for refreshment between launching and flying.

This machine is fitted with two Rolls-Royce Eagle IX engines and in its present state it is bereft of internal fittings and windows. The lack of seats etc. gives one a better opportunity of realising the size of the hull which regarded from the nose and looking aft resembles a section of a tube railway, there being no cross-members throughout its length. The pilot and mechanic or second pilot are situated in a separate structure which is built on to the top of the hull.

The amphibian undercarriage is very wide and although a hand operating gear can be used if necessary the normal operation is by windmill situated in the slipstream of the starboard airscrew.

On its first flight with Capt. Biard as pilot the machine took off easily, climbed to 2,000 feet, manœuvred well, flew hands and feet off, and performed generally as one would expect of a Supermarine boat.

In the works itself a large number of Seagulls are in for reconditioning and various modifications. A batch of twelve light-bomber flying-boats to be fitted with Rolls-Royce Eagle IXs is in course of construction for the Spanish Navy. And in addition in the boat-building shops and in the erecting shed there is much of interest to be seen but not to be described.

The present position of the Aircraft Industry, relying as it does almost exclusively on orders from the Air Ministry, makes any visit to an aircraft works interesting, that is assuming that the firm in question permits one to see its darkest secrets, but as the result there is very little of which one may write.

Under these conditions one can only say that the Supermarine Co. are still pursuing their policy of improving the breed of flying boat for all purposes and that the present year is going to bring forth more than one highly interesting machine.

A Canadian Deal.

One learns that the Laurentide Air Service of Grand' Mère, Quebec, Canada, have sold eleven H.S.2L flying boats to the Ontario Government for $7,000 each. It is said that these cost them somewhere in the neighbourhood of $500-1,000 each, plus freight and reconditioning, so the Laurentide Co. appear to have concluded a good piece of business for which they deserve congratulation.

But one certainly wonders what prompted the Ontario Government to indulge in such an extraordinary deal. The H.S.2L is a very old type of American flying boat and the specimens concerned in this deal are almost certainly American war service disposal stock.

It strikes one that if the $77,000 had been spent on acquiring a smaller number of up-to-date aircraft designed specially for the purpose by British constructors it would have been a much more profitable proposition for the Ontario Government.

New Technical Literature.

R. & M. No. 887. Experiments with a Close Tandem Airscrew Pair. By E. J. Norman (R.A.E.). Price 3d. net.

Journal of the Royal Aeronautical Society. No. 160, Vol. xxviii, Apr. 1924. Contents: Report of Annual General Meeting Mar. 27; Some Materials of Aircraft Construction, by J. D. North; Materials in Aircraft Construction, by Dr. L. Aitchison; Radial Air-Cooled Aero Engines, by A. H. R. Fedden. Published by the Society, 11, Albemarle Street, London. Price 2s. 6d. (to non-members).

DISTINGUISHED VISITORS.—Here are seen the members of the Spanish Royal Naval Special Commission which visited England recently to inspect British aircraft construction. The picture was taken at the Air Port of the Supermarine Aviation Works Ltd. at Woolston, Southampton. The group includes from left to right: Capt. Biard, chief pilot of the Supermarine firm; Mr. Mitchell, chief designer; Mr. Hill; Capt. Pedro Cardona, Spanish Royal Navy The Marquis Soto Hermosa; J. Franso Mr. Leigh-Mossley, of the Supermarine firm. The photograph was taken just after Capt. Cardona had been for a flight in one of the Supermarine Company's boats piloted by Mr. Hill. It will be remembered that the Spanish Navy has bought twelve Supermarine flying boats.

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 6; Tuesday, 7; Wednesday, 5; Thursday, 6; Friday, 5; Saturday, 5; Sunday, 5.

Paris—London:
Air Union, machines 27, passengers 133, freight 9,621 lbs.
London—Rotterdam:
K.L.M., machines 12, passengers 30.
Special Machines: 0.
Total number of trips by British machines: 0, carrying 0 pas. Foreign machines: 39, carrying 163 passengers.

Comparative Figures:
For week ending April 13:
Machines, 39; Passengers, 163; Crews, 59; Total personnel, 222.
Corresponding week, 1923:
Machines, 96; Passengers, 366; Crews, 156; Total personnel, 522.
Corresponding week, 1922:
Machines, 75; Passengers, 211; Crews, 128; Total personnel, 339
Corresponding week, 1921:
Machines, 53; Passengers, 179; Crews, 69; Total personnel, 248.
Corresponding week, 1920:
Machines, 36; Passengers, 32; Crews, 36; Total personnel, 68.

Croydon Notes.

The British pilots officials and machines still remain "embusqués," as the French say, and the foreign machines are having the time of their young lives running fully loaded with passengers and goods on almost every trip. At the moment of going to press it seems probable that there will be an early settlement of the present difficulties. It is to be hoped that this is so, as doubtless everyone, pilots, officials and would-be passengers are tired of the present state of masterly inactivity.

It is doubtful whether even if there is a settlement in time things will be normal for the rush of Easter traffic. Still it would be a good thing for the new company to start work with a goodly rush of passengers and the consequent publicity.

The number of passengers carried by the Air Union and K.L.M. this week was 163. Many machines flew loaded to their capacity. Only 12 machines carried no passengers and they were freighters.

It is now announced that the improvement scheme for the aerodrome is to begin at once. Plough Lane is to be diverted and the old military aerodrome is to be joined on to the present ground. The present offices and other buildings will be demolished and new buildings of more suitable and durable structure and design will be erected in their place. The Beddington and Wallington District Council will receive £15,000 compensation, which seems unnecessarily generous, seeing that the development Air Port and the increase in the number of employees will bring many new residents to the district.

The Aircraft Disposal Company are busy at the moment on an engine contract. There has been a certain amount of trouble lately owing to the noise caused by the testing of the engines in a shed near the Company's railway siding. Questions in the House have already arisen over this matter.

Mr. Perry made four tests with a Bristol Fighter and also tested an Avro Lucifer and a Martinsyde.

The following has been received from an absconded correspondent:—

(Alleged New Company)—Imperial Prayerways Ltd.

(Motto: *"I'll build an airway to Paradise."*) The following appointments to the above company have been made: *Chief Pilot,* Admiral Mark Kerr. *Pilots,* Claude Grahame White, Sir Sefton Brancker, P C. R. Groves, N. Pemberton Billing, Winston Churchill, Mrs. Atkey, Sir Hugh Trenchard, The Lord Edward Grosvenor, The Hon. Elsie Mackay. *Apprentices for training as pilots,* Harold Perrin, C. G. Grey. *Technical Director,* Harry Harper (Note:—The post of General Damager and Chaplain General is still vacant.) (Signed) Frankly Surly, Managing Director.

The Plymouth-Belfast Scheme.

The scheme for an air mail line between Plymouth and Belfast to expedite the delivery of letters from America to the Midlands of England and to Belfast was advanced a step further by a Conference called by the Plymouth Chamber of Commerce which took place on April 3 at the London Chamber of Commerce. One learns that the Chairman of the Postal Committee of the London Chamber of Commerce was in the Chair and that Sir Sefton Brancker and Colonel Edwards attended on behalf of the Air Ministry.

Among those also present were the Chairman of the Liverpool Chamber of Commerce, the Mayor and Town Clerk of Plymouth and the Secretary of Plymouth and the Secretary of the Plymouth Chamber of Commerce. Mr. Theodore Instone and Captain Alfred Instone appeared as representatives of the London Chamber of Commerce and gave hearty verbal support to the scheme from the point of view of advancing Civil Aviation in this country.

On the whole the Conference may be considered a decided success as it was arranged purely by business men. The Chairman of the Liverpool Chamber pointed out that it was no use merely enthusing over the possibilities of aviation to the hard-headed business man of the North, it was necessary "to get down to brass tacks." He was sure that Liverpool would support the scheme if it could be proved that it would hasten the delivery of mails.

One gathers that a proposition was put forward on behalf of the Aircraft Operating Co. Ltd. to run a daily service for 275 days in the year for £10,000 with De Havilland two-seaters carrying 350 lbs. of freight or for £16,500 with four-seaters carrying 1,000 lbs. of freight. The Conference resolved to appoint a committee to draw up a complete scheme for an air line and submit it to the Air Ministry and one gathers that Sir Sefton Brancker expressed himself as very well satisfied with the meeting.

New Companies.

Imperial Airways (Somerset House Particulars).

Imperial Airways, Limited, was registered as a public company on Mar. 31, with a nominal capital of £1,000,000 in £1 shares. The objects are: to acquire (on such terms as the President of the Air Council shall in writing reasonably approve) the businesses heretofore carried on by (1) the Handley Page Transport, Ltd., (2) the Instone Air Line, Ltd., (3) the Daimler Hire, Ltd., and (4) the British Marine Air Navigation Co., Ltd., as aerial transport companies, or, in default of such acquisition, to establish an air transport service to operate equivalent services; to enter into an agreement with the President of the Air Council in accordance with the draft contained in the White Paper dated December 22, 1923, signed by Sir Samuel Hoare, to manufacture, repair, buy and sell balloons, aeroplanes, hydroplanes and airships of all descriptions, and their component parts, fittings and accessories, to provide and erect aerodromes, landing stations, buildings and sheds, to make arrangements for and procure to be carried on air transport services in all parts of the world, to arrange for aviation meetings and exhibitions, to give instruction in the art of aviation, etc. Power is taken to manufacture (in addition to aircraft) motor vans, waggons, cars, cycles, omnibuses and vehicles, and to carry on business as carriers, manufacturers of portable buildings and domestic offices., etc.

The subscribers to the memorandum of association (each signing for one share) are:—E. Newton, 81, Gresham Street, E.C.2, solicitor, L. E. Giffen, Mensfield, St. Albans, solicitor, and five clerks.

A letter from the solicitors, dated Mar. 29, stated that to that date no person had consented to act as a director of the company.

The number of directors is not to be less than 3 nor more than 10. During the continuance of the agreement above referred to, the President of the Air Council may appoint two "Government" directors Qualification (except "Government" directors): £500 shares.

Remuneration: £6,500 per annum (which sum may be increased by the company in general meeting) divided between them.

During the continuance of the said agreement, the profits available for distribution in each year are to dealt with as follows:—

> (a) A sum equal to 10 per cent. on the paid-up capital to be set aside for dividends, (b) the balance to be divided into three equal parts, the first to be applied in or towards repayment to the President of the Air Council of the yearly subsidies mentioned in the said agreement, the second to be applied in the development and improvement of the air service to be provided by the company and the development of British Civil Air Transport, or either of them, and the third to be set aside and be available for distribution among the shareholders.

No person may become or remain a member of the company who is not a British subject and no corporation may become a member unless it is incorporated under the laws of the U.K or some other part of the British Empire.

The directors may borrow up to the amount of the nominal capital for the time being without the sanction of a general meeting. Solicitors: Clifford Turner and Hopton, 81-7, Gresham Street, E.C. No notice of situation of registered office was filed at time of incorporation. The file number is 196,879.

PERSONAL NOTICES.

Deaths.

GOLDSMID.—On Apr 7 while flying, Francis Frederic Rowsell Goldsmid, Plt. Off., R.A.F., only child of Maj. and Mrs. G. S. Goldsmid, Connaught House, Denville, Havant, Hants.

Mr. Goldsmid was posted to the School of Army Co-operation, Old Sarum, on Dec. 20, 1922, from the R.A.F. Cadet College, Cranwell. At the inquest it was stated that the machine, a Bristol Fighter, nose-dived from a height of 500 ft.

MOSS.—On Apr. 9, at Farnborough, as the result of a flying accident, Charles William Moss, Plt. Off., No. 4 Sqdn., R.A.F.

Mr. Moss was posted to No. 4 Sqdn. on Dec. 19, 1923, from the R.A.F. Cadet College, Cranwell. He was flying a Bristol Fighter when the accident occurred.

NICHOLLS.—On Apr. 7, at Old Sarum, L-AC. H S. Nicholls, R.A.F., aged 20. L-AC. Nicholls was the passenger in the accident at Old Sarum.

THOMAS.—On Apr. 4, at Ottawa, R. Q. Thomas (late R.A.F.), aged 29.

Marriages.

MURPHY—OLIVER.—On Apr. 8, at Morpeth, Flt. Lt. F. J. Murphy, R.A.F.M.S., third son of the late Professor Murphy, and of Mrs. Murphy, Dunroe, Skerries, Co. Dublin, to Margaret Vera, youngest daughter of Mr. and Mrs. R. C. Oliver, Bowmer Bank, Morpeth, Northumberland.

Births.

VINCENT.—On Apr. 9, at Westfield Cottage, Hatch End, to Betty (*née* Payton), wife of Flt. Lt. S. F. Vincent, R.A.F., A.F.C.—a son.

ROBERTS.—On Apr. 4, at Rawalpindi, India, to Mary, wife of Flg. Off. John Vaughan Roberts, No. 5 Squadron, R.A.F.—a son.

THE AEROPLANE

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Edited by C.G.Grey

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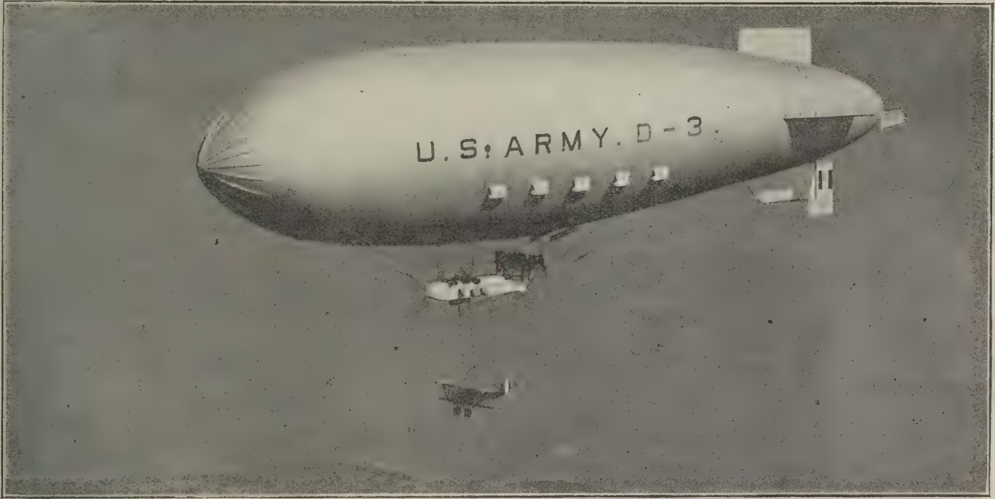
SUSPENDED ANIMATION.



AN AERIAL UNION:—The first contact established between an aeroplane and an airship while flying. In this case a Sperry Messenger biplane hooked itself onto the U.S. Army Airship D.3 on Sept. 18, 1923, at Langley Field, Va.—This experiment must not be confused with some of the previous "flirting-with-death" cinema stunts organised by civilians, for which America at one time was notorious.

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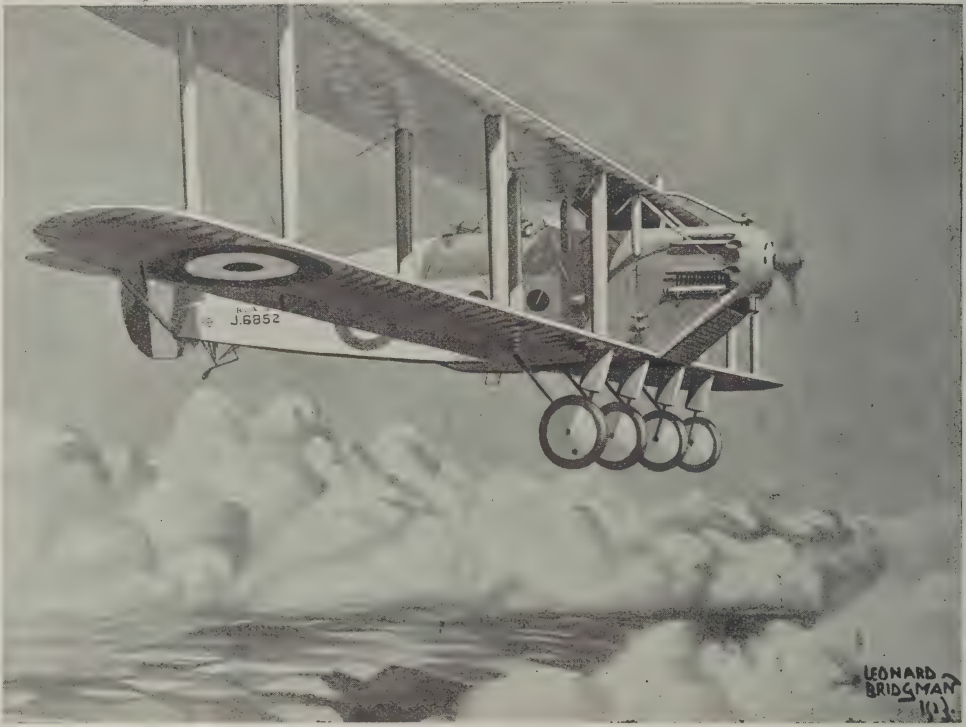

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ON THE R.A.F. MISSION TO FRANCE.

It is typical of our attitude to everything connected with the Services that so little interest should be taken in this country in the R.A.F. Mission which has been visiting France with Air Vice-Marshal Brooke-Popham as its chief. Nobody in England regards the Mission as having any political significance but those who have taken the trouble to think about it at all merely think that the French have been rather nice and friendly to let our people run about their aviation establishments and see what they can see. And of course everybody has quite forgotten that a very similar French Mission visited England last year. We have habitually this casual outlook on things in England.

The French view of the R.A.F. visit is quite different. The leading French aviation paper, *L'Air*, devotes almost a whole page to the arrival of the Mission, heading it with an agreeable and typical photograph of Air Vice-Marshal Brooke-Popham chatting with General Dumesnil immediately after his arrival at Le Bourgêt. And an elegant writer over the initials M.O. discourses on the visit thus:—

> The English Mission has just come to pass eight days in France. This fact would have nothing extraordinary about it if certain exterior political circumstances had not accompanied it. Numerous are the foreign missions which come to France but this has a particular character. We have therefore asked of an authorised personality in French official aeronautics to be good enough to situate for the readers of *L'Air* the importance of the British visit. Here is what he has answered:—
>
> "If this Mission had come in January or February last it would have passed to us unperceived. In fact it would have done nothing except render to the English the politeness which they made to us in receiving last year a French aerial Mission of which the chief was General Barrès. But chance willed it—and this was happy—that it was only decided for the Spring of 1924
>
> "The fact is that at the beginning of last March the new Prime Minister of England Mr. MacDonald had the occasion to write to M. Poincaré a diplomatic letter, which apart from that had the character of a public letter. One paragraph concerned aeronautics and it was important. Mr MacDonald expressed the anguish of the British Government who thought that our aerial armaments were directed not against Germany but against Great Britain.
>
> "Such a declaration provoked in France a stupor which was not feigned. The Quai d'Orsay was alarmed. Very active conversations took place between the Minister of Foreign Affairs and the Embassy in London. The latter seized with enthusiasm the occasion of the coming to France of the British aerial mission to attach to this voyage a political importance of the very highest interest.
>
> "In effect, what have we done? We have said to the English aviators:—'You accuse us of anti-British views. To say it, it is necessary to prove it. We are going on the contrary to show you that all our aerial armaments are directed against Germany, not with an offensive aim but to protect us. You are going to divide yourselves into four groups. One of them will remain in Paris to visit our technical installations. The three others are going all over France to visit our regiments. We will give them free entry everywhere They can see everything and look at everything. And you will see then that our aerial formations are concentrated in such a way that not one of them directly menaces England.'
>
> "We are able to say that our English friends have been convinced. They have formerly been allowed to believe that France was arming against them in the air. What a joke! But in fact perhaps it was not a joke and it still remains to be known who were those who led the campaign on the other side of the Channel. Perhaps it might be perceived that the most enthusiastic were the English constructors. We would not wish to make it a grievance against them that they have defended their interests, but we wish very much that they would find some other pretext for intervening in the affairs of their Government.
>
> "For in fact that which consists in saying 'Take warning—France is preparing against you!' can now no longer be in fashion. And we are persuaded that here will be one of the most interesting results of the coming to France of the British Mission."

This is certainly a most valuable point of view. But it is regrettable that M.O. should have made the mistake of accusing the British Aircraft Industry of having incited agitators to propagate the idea that France is arming against us. People who are so much inside the affairs of aviation as are the British aircraft constructors know a great deal too much to indulge in such clumsy political tactics. Those who have studied this anti-French agitation, which has been almost entirely in Parliament, will have noticed that those Members of Parliament who have made the greatest song about the growth of the French Aviation Service have been those who know least about aviation and who are certainly least in touch with the British Aircraft Industry.

The point of view of the British Aircraft Constructors has been simply that of the leading people in the Air Ministry, namely that on general principles we must have an Air Force at least as big as any other air force in the World. Therefore the bigger the French Aviation Service the better it is for the British aircraft constructor. Neither the Air Ministry nor the Aircraft Industry is in the least likely to cry out against the size of the French Air Service so long as the British Government is prepared to increase the R.A.F. to the same size as the French Service.

So far as one has taken the trouble to follow the political outcry about the size of the French Aviation Service one has regarded it as the self-produced effort of third-rate political brains which imagine that cheap jingoism goes down with the British public better than solid argument.

There is of course always a chance that in some moment of political stress some future French Government, smitten by that mass hysteria which afflicts Mediterranean peoples more easily than Nordics, might be inclined to "make a demonstration" by concentrating its forces of aeroplanes on the French Northern aerodromes. But one cannot believe that any French Government would be so utterly foolish as to allow any such aircraft to cross the Channel and trespass over British territorial waters for the French know very well that despite the smallness of the Royal Air Force and the reduction of the British Navy such an act would mean the prompt obliteration of the majority of the French ports.

Moreover the French know perfectly well that any hostile act against England would promptly be followed by a German onslaught on France. Therefore there is not the slightest need for us to concern ourselves with the possibility of any French war with England.

On the other hand one pays the French General Staff the compliment of assessing their intellect as being not inferior to that of the British General Staff. Consequently one believes that the building up of the French Aviation Service is not even intended purely as a defence against Germany. It is in fact intended ultimately for operations against Russia.

As the political situation in Europe develops it becomes more and more evident that the French policy of arming and equipping the Jugo-Slavs, the Roumanians, the Poles and the Czecho-Slovaks is a perfectly well-conceived and well-arranged scheme to create a barrier from the Baltic to the Adriatic against the Muscovites. But where one thinks that the French General Staff is making a mistake is in imagining that it can depend upon these Central European States to put up a fight against a well-organised Muscovite army.

Most of them will put up no sort of fight at all. Some of them will certainly go straight over to the enemy as they did in 1914-15. And the rest will collapse without much fighting. The only hope is that they may hold together just long enough to fight delaying actions until the Germans and English can organise properly on the Northern defence line and till the French can reinforce the Italians on the South.

That being so one believes that Air Vice-Marshal Brooke-Popham's Mission will be extremely valuable both to France and England both by creating good feeling between the air services of the two countries and by giving our Air Staff a proper insight into the real strength and value of the French Service d'Aviation Militaire.

One remembers that many many years ago a French Naval Mission visited Portsmouth when the British Navy was not quite so strong as our neighbours across the Channel believed it to be. The French naval officers were shown almost everything in the dockyard at Portsmouth with the exception of the interior of certain sheds which were bolted and barred and ostentatiously guarded and marked "secret." The English officers were most apologetic to their guests and regretted that they were unable to show them the contents of these sheds. The French were duly impressed with the idea that we had some vast secret naval machinery under construction and went away happily ignorant that the sheds were empty.

One cannot believe that the French authorities have committed a similar psychological error in showing the strength of France to their English visitors either in material or intellectual affairs. Probably by now the members of our Mission have discovered the degree to which the sheds and heads of French Aviation are empty or occupied.—C. G. G.

THE WAY OF THE ROYAL AIR FORCE.—II.

By C. G. GREY.

Technical Improvement.

As for general flying in Iraq the R.A.F. does not subsist solely on the spirit of heroism. It has in its due proportion that spirit of solid hard work and high efficiency which made the British Army of 1914 the finest fighting machine in the World, and this state of efficiency has been built up gradually, for when the R.A.F. found itself in a state of partial peace in Iraq at the end of 1918 it was by no means well equipped and it lacked modern instruments and gadgets.

It was a fine fighting force but it was not highly scientific. And little wonder at that, for the best machines and the best weapons were strictly reserved for the West Front and "Mespot" had to carry on with what it could get of the leavings. Even a year or two ago Iraq was still taking out of store war-time aeroplanes which had been sent on from India because the R.A.F. in India did not want them.

Iraq's only single-seaters were Snipe which had spent three or four years in boxes in India and some of the poor old things actually fell to pieces when pulled out of their cases in Iraq. Others tried to fall to pieces in the air and were only persuaded to land as a whole apparatus by the great skill of their pilots. And even to-day, barring a few of a newer type designed in 1918 and built within recent years, the ancient Snipe is still the standard single-seater.

A Bombing Jaunt.

Until comparatively recently bomb-dropping consisted chiefly in pulling the string and hoping for the best, largely because modern bomb-sights and bombing methods were unknown in Iraq. But of late the technique of bombing has improved, thanks very largely to a Squadron Leader who happens to have made a hobby of bombing and navigation alike. It is said that after a course of systematic training his Vernons were able practically to obliterate any target on which they concentrated their attention.

There is a story that one pitch black night he himself on a Rolls-Royce-engined Vernon bulging with bombs of every kind took off a landing ground whose total length was about equal to the length of run required by a fully loaded Vernon in taking off. He found his target over fifty miles away by dead-reckoning, located it accurately with half-a-dozen spot-lights which he had rigged up on his machine, and then lit it up properly with Michelin flares; after which he proceeded to bomb it to the complete satisfaction of those on board the machine.

Three hours later when another machine came along helped by moonlight the target was still burning. Incidentally this second machine had a valve break off at the stem when over the target. Naturally the valve head went through the piston, but in spite of that the engine managed to keep going all the way back to the aerodrome—three-quarters of an hour's flying.

The spirit of the R.A.F. in Iraq was rather well illustrated by one officer on that particular expedition who having gone out on the first machine as a spare pilot, and thus having done one night trip of three hours, started again two hours later as a passenger on a two-seater and made another trip of two-and-a-half hours to have a look at the effect of his first journey.

No Smoking in the Lift.

It is not only the risks of landing in enemy territory or of coming to grief in the dark which are trying to the nerves of the pilots in Iraq. There is a story of one pilot who himself says that he very nearly had hysterics in the air on one occasion from the cause least of all to be expected.

He was acting as second pilot on a big machine which was carrying something over a dozen men of His Majesty's Army with complete equipment, rifles, ammunition and all, from one point in Iraq to another in a hurry. Half-way on the journey and right over the middle of nowhere, well off the track of any other aeroplanes, the pilot happened to look inside the cabin to see how the troops were standing the trip. To his horror he found the whole lot sitting peacefully in their shirt sleeves on the two benches which run along the sides of the cabin and the whole lot were smoking!

More also were his nerves affected when he saw that the floorboards of the machine were thoroughly well burnt where the men had knocked out the glowing dottles of many previous pipes. He managed to convince them that it was only by the grace of God that they had not assisted in giving an imitation of a comet, and they behaved very nicely for the rest of the journey. But he said that nothing during the War had ever shaken him so much as did that particular incident.

The Aero-Ambulance Service.

The mention of troop-carrying reminds one that nothing has ever been said in print about an extremely fine piece of work done by the R.A.F. during the Sheikh Mahmud affair. On that occasion a number of troops were employed, largely in settling country which had already been made fairly quiet by the R.A.F. Unfortunately there was a severe outbreak of sickness and as the only way out lay through unfriendly country without roads it would have been very difficult to have got the sick men down on mule back without losing a good many of them at the hands of hostile snipers, besides which the severity of the journey would probably have killed many of them.

By good fortune one has been able to acquire most of the details of this entertaining performance. The troops concerned were men of two British battalions who had been well up in the Kurdish hills near Rowanduz and were on their way back to Baghdad when the sickness fell upon them. They had no transport other than pack animals, for the Kurd, like his relative the Pathan, does not believe in opening his fastnesses to motor traffic. So aircraft seemed the only possible form of motor ambulance.

The Great Great Ones decided that if the two hundred sick could be picked up by aeroplanes they should be transported to Kirkuk, so off went five big twin-engined machines to that well-known health resort. By the time they got there the column with its sick had got down to near Serkhuma where the surface of the country mostly approximates to the vertical and where the climate is not of the most amenable for flying. However, the R.A.F. found a flattish spot or two big enough for their big machines and in spite of the weather managed to land there and get away again.

Pilots of adequately-powered two-seaters who knew the country said that during the first two days of the operations the weather was as bad as the worst they had met. The big twin-engined machines had to get up to 5,000 feet before the pilots could keep control of them when crossing the ridge of the Adghir Dagh, and before they discovered this one unlucky (and yet lucky) pilot was brought down from 3,000 feet by down-current and forced to land although both engines were full on and giving full power.

The astonishing thing about this forced descent was that although the machine was full of sick men nobody was hurt. In fact so amazingly skilful was the pilot's landing that one of the sick men had to be waked-up after the crash and told to get out of the machine. This sounds like a very ingenious effort of the imagination but one dare not disbelieve it, coming whence it does.

There was no hope of getting the machine out of the hole where it had put itself, so as our old friend Sheikh Mahmud (or Shaik Mahmood, as some of the unregenerate in Iraq still insist on calling him) had sundry hostile gangs in the vicinity the machine had to be burnt. Nevertheless one gallant lad on a two-seater brought out a Medical Wing-Commander of the R.A.F. to superintend the handling of the sick, and then, in spite of bad ground and an atmosphere which gave him practically no control over his machine till he was well away, he took off with the sickest of the sick men in his back seat. As the poor fellow was likely to die anyway it mattered little, apparently, whether he died *in situ* or was killed in another crash. But luck was with him and the pilot got away with it (and him) and saved his life by getting him to Kirkuk in time.

The rest of the sick were chaperoned down to Koi by the Medical Wing-Commander and all survived the donkey transport. It was quite impossible to load another aeroplane anywhere near them.

Staff Work.

The R.A.F. Authorities were duly wily in making their arrangements. The best machines and pilots were picked for the voyages over the mountains from Kirkuk to Betwata and Koi and back, and to "mak 'siccar" each machine was rigidly inspected between each flight. To which may be attributed the fact that nobody had a forced landing owing to mechanical failure on that part of the route. And just by way of demonstrating the keenness of the ground personnel one may mention that a Sergeant-Major and a Sergeant of the R.A.F. put in an average of sixteen hours' work a day for three days on this inspection work after having already done a twenty-four hour stretch at Hinaidi getting the machines ready for the job. That ought to please some of the people who want to run the Services under Trade Union rules.

One is told that none of the sick objected to air transport. Probably most of them before they started felt something like Jerome K. Jerome's description of sea-sickness,—"For the first half-hour you're afraid you'll die. For the rest of the time you're afraid you won't." But some of them definitely said that they liked flying. And the R.A.F. was clever enough at the later stages of the operations to forward the worst cases from Kirkuk to Baghdad in the early morning or in the evening so as to avoid bumpy weather and subsequent air sickness. Possibly that flying doctor-man had that fellow-feeling that made him so wondrous kind.

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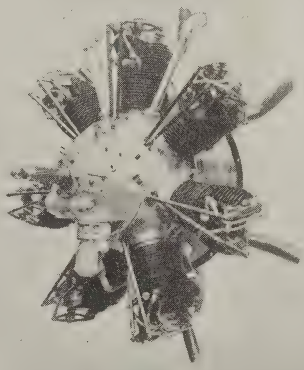

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Seemingly the only fly in the ointment was that the aeroplanes had to sit alongside the troops so long in nasty rough Kurdistan waiting for the column to sort out its sick and stow them in the machines. Which meant wasting time and using more machines that would otherwise have been necessary. One suggests that the next time it has to do a job of this kind the R.A.F. might send one of the unemployed despatch-clerks from the disused air-lines at Croydon to the column as its agent in advance.

A Few Figures.

Of course in an affair of this kind one must mention no names, not even the numbers of squadrons. But one may say that one squadron carried 121 sick from the column to Kirkuk and 118 from Kirkuk to Baghdad. It used six machines, put in about 88½ hours' flying and covered 6,420 miles. The other squadron took 77 sick from the column to Kirkuk and 80 from Kirkuk to Baghdad. It also used six machines and it covered 3,195 miles in about 40½ hours' flying. The first squadron had two forced landings without sick aboard and the one with a load of patients as already described. The other had one landing through engine failure with sick aboard and it crashed one empty machine.

Apart from the sick the first squadron brought in some medical personnel and two loads of assorted details from the column. And the other, besides medical personnel, brought in two loads of ambulance salvage.

Altogether the R.A.F. can fairly congratulate itself on having done a very good job of work as is fitting for the First Line of Defence. One merely wonders mildly how the job would have appealed to some of our much-advertised air-line pilots who demand a Wing-commander's pay for flying three or four days a week over a regular route which they ought to know as well as they know Piccadilly.

The Trials of Seniors.

It may be well to mention, just because so many people imagine that senior officers of the R.A.F. do no flying and that an aviator ceases to be useful as such at the age of thirty or thereabouts, that Air Vice-Marshals and Air Commodores fly habitually on their lawful occasions—apart from some who stil love flying for flying's sake and are disrespectfully called "air hogs" by their subordinates. Also, such minor Powers as wing-commanders and group-captains are supposed to continue to be pilots and are posted to Senior Officers' Refresher Courses, which are on occasion a joy to junior officers.

Sometimes these very senior pilots cause acute embarrassment to those of low rank as may be judged from the sad little tale from over-seas related by one of the lowly in a letter to a friend thusly :—

"I was filling up to return here, when a Bristol appeared, made a series of birdlike hops across the landing ground, took off again, and repeated the performance, only somewhat more so. He taxied up; it was one whom I'd never seen before. I remarked that the landings weren't up to much that morning, and he agreed.

"*Then,* he proceeded to remove his Sidcot. As stripe after stripe appeared I grew more and more abashed, until a real live Group Captain (Air Staff) stood revealed with a perfect flag-day of ribbons. I climbed into my balloon and left hurriedly."

But in spite of such happenings it is all for the good of esprit de corps that the seniors should fly. And when the Technical Experts at the Air Ministry awaken to the fact that aeroplanes *can* be made which get off and land by themselves and do not stall or spin under any circumstances there will be no reason why the maimed and the halt and the blind among the senior officers should not fly with rather more safety to themselves and others than when they are driving automobiles on the public roads.

Unnecessary Fatalities.

Which reflection brings us back to the original statement that the R.A.F. is always on active service even on home stations because it is continuously at war with the air. The crop of casualties in England is if anything bigger than that over-seas. And it is needlessly heavy simply because of the obstinacy or stupidity of the Technical Staff.

There must always be a certain number of deaths by collision in the air and through unforeseeable causes. But the majority of deaths and injuries are caused by machines stalling in getting off or in trying to land in bad places or in turning to get back into aerodromes after engine-failure. Such casualties can be avoided if only the Technical Staff will adopt modern ideas and if the Supply Department will scrap all the machines at present in use and will equip the R.A.F. with properly stable aeroplanes.

In the old days one carried on a continual war against the technical people because they insisted on inflicting on the R.F.C. such machines as the B.E. and R.E. series which were inherently stable up to a point in that they did not capsize in the air and would fly themselves when once in the air. But they paid for their stability by decreased performance which left them at the mercy of the more efficient German aeroplanes. And if they lost flying speed they stalled, put their noses down, and dived uncontrollably for a hundred feet or more before they could be got under control again.

Every machine in the R.A.F. to-day, with perhaps the exception of one type which is not in use in quantities, is just as subject to stalling and diving as was any machine of 1912 or 1913. And that is the cause of nearly all the casualties in the Air Force. Yet any aeroplane designer worth his salt can produce a machine which without loss of performance will refuse to stall and dive.

The Cure for Most Evils.

Machines already exist which when pulled back below their flying speed merely sink vertically for a few feet and then proceed to glide forward under full control. And the R.A.F. has a small number of machines which with a top speed of about 145 miles an hour fly under full control at 45 miles an hour and can be dropped onto the ground at less than 40 miles an hour.

If the R.A.F. were equipped with aeroplanes big and small possessing those qualities it would be practically impossible for any pilot to kill himself except by gross carelessness or recklessness, such as flying at top speed through a fog and hitting something. And now that such machines are procurable one merely wonders why in Heaven's name the R.A.F. does not have them

There have been excellent reasons for the past five years why the R.A.F. has had to carry on its war in the air on antiquated aeroplanes designed in 1916 and 1917. And there have been adequate reasons why instead of buying machines of modern designs the Supply Department has had to be content to re-issue "reconditioned" antiques. But that time is past. There is now plenty of money available for the purchase of new types and there is no reason why the R.A.F. should not have them.

All the economies which have perforce been made in the equipment of the R.A.F. during the past two years have definitely been effected at the cost of the lives of the pilots and their passengers who have been killed in stalled or spinning aeroplanes. And if such fatalities continue in the future the result must inevitably be a revival of the notorious "Murder Charges" originated by that staunch Conservative Mr. Walter Faber and popularised by Mr. Pemberton Billing.

The R.A.F. at home has quite enough to do on active service in its war with the air without having its lives thrown away because of the obstinacy or stupidity of the Technical Staff or because powerful vested interests insist on maintaining incompetent designers. The time has now come when we can afford to make flying other than in the face of the enemy as safe as any other form of transport. The money and the technical knowledge are both available. And the job has got to be done.

The Air Line Dispute.

It is understood that Major G. E. Woods Humphery, General Manager of Imperial Airways Ltd., has issued writs for alleged libel against Lieut.-Col. G. L. P. Henderson, Mr. F. L. Barnard and the Federation of Pilots. The alleged libel is contained in a statement sent by the pilots to Sir Eric Geddes, Chairman of Imperial Airways Ltd.

This seems to be the most sensible move made so far in the dispute as opportunity will now be given to prove or once and for all to disprove sundry assertions that have been made.

Efforts to bring about a settlement of the dispute at Croydon Aerodrome, which has now lasted for three weeks, were resumed on Monday. Lord Thomson, Secretary of State for Air, and Sir Sefton Brancker, Director of Civil Aviation, remained in London in order to render any service they could, and Sir Eric Geddes, Chairman of Imperial Airways Ltd. has also assisted in the negotiations.

The following statement was issued by the Air Ministry on Apr. 21 :—

> The Secretary of State has seen representatives of both parties. The Air Ministry is watching developments closely and is doing its utmost to promote a speedy settlement, but so far is of the opinion that the issue is one which should be determined by direct negotiations between the parties concerned.

The late Lawrence Sperry.

The Air Ministry announces that as a result of the investigation into the circumstances of the accident to aircraf G-EBIJ, piloted by Mr. Lawrence B. Sperry, which occurred on Dec. 13, 1923, the Inspector of Accidents arrive at the following conclusions :—

- (a) That the pilot was forced to alight in the sea owing to complete failure of the engine and he was subsequently drowned in an attempt to swim ashore.
- (b) That the failure of the engine was due to warping, and consequent seizure, of the valves of the top cylinder followe by a displacement of the tappet rods.

Per Napier ad astra—

A 450 h.p. Napier aero engine will be on view at Wembley—Exhibit 71a—Motor and Cycle Section.

A Fokker machine, fitted with a 450 h.p. Napier aero engine, in South America on 21st Jan., 1924, piloted by Mr. Otto Ballod, reached a height of 21,454 feet whilst carrying a load of 1102½ lbs.

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THE GLOBE TROTTERS.

The British Expedition.

After an enforced stay at Corfu from Mar. 30 Sq. Ldr. A. S. MacLaren, Flg. Off. Plenderleith and Sgt. Andrews on the Vickers Vulture got under way again on Apr. 16.

On Apr. 13 the Vulture was launched from the scene of its forced landing and towed to Corfu by a British destroyer. At noon on the 14th the new Napier arrived from Brindisi and was installed in the machine on the same evening. The installation was completed on the following day and a successful trial trip was made in the evening.

On Apr. 16 the expedition left Corfu and arrived at Phaleron, Athens, at 14.45 hours after a flight of 3 hrs. 20 mins. under ideal weather conditions. They were welcomed at Athens by Capt. Hajikyriakos, Minister of Marine, the O.C. the Greek Air Force and members of the British Colony.

On Apr. 17 they left Phaleron at 11.15 hours for Cairo, after an unsuccessful attempt to get off at 08.00 hours owing to the extreme glassiness of the sea. At 18.15 hours a message was dropped in a biscuit-tin over Aboukir asking that Heliopolis be informed of the arrival of the Vulture. At 19.40 hours a landing was made on Heliopolis aerodrome by the light of a nearly full moon and landing flares after a flight lasting 8 hrs. 25 mins.

On Apr. 19 the Vulture left Heliopolis at 06.42 hours for El Ziza 22 miles S. of Amman where it arrived at 13.30 hours after a landing at Abu Sueir owing to slight mechanical trouble.

El Ziza possesses no aerodrome but consists of an R.A.F. hut and petrol store and is a station on the Hedjaz Railway boasting one train per fortnight.

On Apr. 20 the Vulture left El Ziza at 09.35 hours and arrived at Baghdad at 16.20 hours after a seven-hour flight against a 35 m.p.h. head wind. The air was very bumpy the machine at times rising and falling 400 feet and it was extremely cold.

The crew were welcomed at Hinaidi by the High Commissioner and Lady Dobbs, Air Vice-Marshal Higgins (A.O.C. all British forces in Iraq), the American Consul and a large gathering of R.A.F. officers and other ranks.

On Apr. 21 Sq. Ldr. MacLaren left Baghdad for Basra and Bushire at 09.00 hours with an escort of three aeroplanes. It was arranged that a landing be made at Shaiba for lunch.

The U.S. Army Expedition.

Major Martin, commanding the U.S. Army Round-the-World Expedition was forced to land in the vicinity of Kiakagvik Bay to the S.E. of Cold and Portage Bays on the Alaskan peninsula on Apr. 15 during the journey to Chignik from Seward.

Two U.S. destroyers, the Cory and the Hull, immediately began a search and the Hull later reported by wireless that Major Martin and his mechanic had been found in Portage Bay. The remaining three machines arrived at Chignik.

Major Martin and his mechanic had suffered from exposure. Their machine, which was brought down by trouble in her Liberty engine, was towed to Kanatak Head, Portage Bay, where the Standard Oil Company has an oil-prospecting plant and a new engine will be brought up for installation from the spares dump at Unalaska.

On Apr. 20 three machines arrived at Dutch Harbour, Aleutian Islands, from Chignik a distance of 400 miles. Major Martin's machine which was still at Portage Bay being fitted with a new engine was expected to arrive at Dutch Harbour on Apr. 21.

The Flight Round Australia.

Wing Commander S. J. Goble and Flg. Off. MacIntyre of the R.A.A.F. who are attempting to fly round the Australian Continent on a Fairey IIID. seaplane (Rolls-Royce engine) in search of suitable sites for defence bases reached Thursday Island on Apr. 16.

In reaching this spot, north of the extremity of the Cape York Peninsula and the most northerly point in Australia they have covered almost a third of their 8,000 mile journey They left Melbourne on Apr. 6 and arrived at Sydney the same day in 10 hours' flying. They then flew to Brisbane and thence to Townsville, Queensland, where they repaired a float. Thence they flew to Cooktown, North Queensland, and so to Thursday Island. Thus they have travelled 2,500 miles in five days' actual flying.

A Lisbon-Macao Flight.

Two Portuguese military aviators Capt. Brito Paia and Lieut. Sarmento Beires left Amadora near Lisbon on Apr. 2 on a Breguet biplane to fly to Macao, a small Portuguese possession at the mouth of the Canton River opposite Hong Kong. The route they will follow is via Villa Nova de Milfontes, Oran, Kairawan Gabes, Tripoli, Benghazi, Cairo, Damascus, Baghdad, Basra, Bandar, Abbas, Karachi, Delhi, Calcutta, Rangoon, Bangkok, Hanoi, Canton and Macao.

On Apr. 21 the machine arrived at Heliopolis aerodrome Cairo.

Pretoria–Cape Town in a Day.

On Mar. 5 two D.H.9s (230 h.p. Siddeley Puma engines) belonging to the South African Air Force flew from Zwartkop aerodrome, near Pretoria to the military training camp at Wynberg, near Cape Town, a distance of 1,000 miles in 9 hours 45 mins. flying time. The machines were piloted by Capt. C. J. Venter, D.F.C., and Capt. H. C. Daniel, M.C., D.F.C.

This is the first occasion on which the Pretoria—Cape Town journey has been completed within the daylight hours of one day. Both the machines left Zwartkop at 05.55 hrs. and arrived at Wynberg at 18.30 hrs. after having made stops at Kimberley and Beaufort West for petrol.

The aeroplanes made the flight in order to co-operate with the Defence Force troops at Wynberg in field operations.

The French Under-Secretariat for Air.

In the report of a Reform Commission set up in 1922 to inquire into the financial condition of France, which has just been published, the only reference to aeronautics deals with a suggestion that the post of Under-Secretary of State for Aeronautics might be abolished and a Directorship created in its place, thereby effecting a minimum saving of 300,000 francs (£3,000 approx.).

Paris-Turin in Three Hours Five Minutes.

On Apr. 5 Capt. Pierre Weiss and Adjt. Van Caudenberg of the French Military Air Service flew from Paris (Le Bourgêt) to Turin in three hours five minutes on a Renault Breguet fitted with a Rateau supercharger. They left Le Bourgêt at 10.00 hours and arrived at Turin at 13.35 hours after having stopped at Lyon for 30 minutes. The average speed worked out at 195 km. (122 miles) per hour for the 600 km. (375 miles) flight.

A Czecho-Slovak State Aviation School.

It is reported that the Czecho-Slovakian authorities are contemplating the opening of a State Aviation School for providing theoretical and practical flying training. The school, which will be under the Ministries of Public Works and National Defence, will open in June at Kbely aerodrome near Prague.

Pupils will receive theoretical and practical training in courses lasting from six to eight months and on obtaining their flying certificates, will complete their practical training on the air lines of the Cie. Franco-Roumaine.

Refresher courses are to be held in connection with the school for aviators following other professions. These courses will be open all the year and arranged so that reserve pilots carry out four flights per month, the instruction being given on Saturdays, Sundays and public holidays only.

The U.S. Air Mail.

The annual report of the U.S. Postmaster-General on the operation of the Trans-Continental air mail service during the fiscal year ending June 30 1923 states that during the year a total of 1,809,028 miles were flown by Air Mail machines, carrying an estimated total of 67,875,840 pieces of first-class mail. A performance percentage of 96.72 was made for the year's operation.

On June 1923 the Air Mail Service had 79 aeroplanes in flying condition, with 15 aerodromes and fourteen W/T stations. Out of the $1,900,000 appropriated for the service during the year 1922/23 $1,774,151 was expended.

Air Operations in Morocco.

The Madrid correspondent of the *Times*, in a communication dated Mar. 26 states that there is a rumour from Africa that the Moors under Abdul Krim have secured the services of a foreign pilot and that a couple of sheds have been erected near Alhucemas. Accounts of an all-day bombardment on Mar. 23 have been received and 32 aeroplanes are said to have been engaged in bombing the suspected sheds. Five hundred bombs have dropped and Lieut. Ansaldo one of the pilots has been wounded by rifle fire.

One may remark that it is remotely possible that Abdul Krim, who has recently extracted four million pesetas (£160,000) ransom money from Spanish captives, has obtained one or two aeroplanes and pilots from France, as on previous occasions when Spain has been at war with the Moors French filibusters have supplied the Moors with arms and ammunition much as they supplied arms and ammunition to the Turks when at war recently with the Greeks and as they are supplying arms by way of the Persian Gulf and South Persia to the Afghans and Pathans.

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THE ROYAL AIR FORCE.

London Gazette.

Apr. 15.

General Duties Branch.—G. Rose is granted a S.S commn. as a Flg. Off., with effect from, and with seny. of, Apr. 7; Plt. Off. C. Guppy is promoted to the rank of Flg. Off. (Apr. 6); Flt. Lt. R. W. G. West is placed on the retd. list on account of ill-health (Apr. 16); Flt. Lt. G. N. Humphreys is transferred to the Reserve, Class C (Apr. 24, 1923); Flg. Off. R. E. Baugh resigns his S.S. commn. (Apr. 16).

Stores Branch.—R. V. Robinson (temp. Capt., I A.R.O.) is granted a S.S. commn. as a Flg. Off. for three years on the active list, with effect from April 15, 1924, and with seny. of Mar. 10, 1919.

Medical Branch.—F. T. Boucher is granted a S.S. commn. as a Flt. Lt., with effect from, and with seny. of, Apr. 2.

Reserve of Air Force Officers.—The follg. Officers are confirmed in rank, with effect from the dates indicated: Flg. Officer C. E. C. Rabagliati, M.C., A.F.C. (Mar. 29). Plt. Off. J. D. Parkinson (Apr. 9). Plt. Off. F. E. Watts resigns his commn. (March 24); the commn. of Plt. Off. on probation R. G. Spencer is terminated on cessation of duty (Feb. 16); Flg. Off. L. W. Lowen is transferred Class A to Class B (Jan. 7).

The R.A.F. Cadet College.

The Air Ministry announces that an examination for entry into the R.A.F. Cadet College, Cranwell, will be held on June 10 and following days.

The number of cadetships on this occasion, owing to the authorised expansion of the Air Force, will not be less than 35. This number will include any cadets who may be awarded King's Cadetships or Honorary King's Cadetships, and one prize cadetship. In addition, one Wakefield Scholarship of the value of £75, tenable for one year, will be offered for competition among candidates whose parents or guardians are in reduced circumstances, with preference to cases due to the late war

The closing date of entry for this examination is Apr. 24, and no form of entry will be accepted under any circumstances after May 8. Applications should be made to the Secretary, Civil Service Commissioners, Burlington Gardens. W.1.

Competition will be conducted in accordance with the regulations for the R.A.F. (Cadet) College, Air Publication 121, which may be obtained from His Majesty's Stationery Office, Imperial House, Kingsway, W.C.2., price 1s.

The R.A.F. Memorial Fund.

The Fourth Annual Report of the Committee of the R.A.F. Memorial Fund for the year 1923 has been received from the Lord Hugh Cecil, Chairman of the Executive Committee of the Fund.

The Report gives a full description of the unveiling of the R.A.F. Memorial on the Victoria Embankment on July 16 with a photograph reproduced from the "Architects' Journal."

The progress of the Vanbrugh Castle School, to which a new wing has been added, is described. The total number of the sons of airmen who fell during the War 1914-18 who live there has been raised to a total of 39. These boys are being educated at the Roan Secondary School where their progress both in form work and sports is exceptionally good. It is hoped that some of them will eventually choose the Air Force as a career and will pass into the Technical Training Schools at Cranwell or Halton where the traditions behind them should give them every prospect of success.

With regard to subscriptions to the Fund £5,247 7s. 11d. was received from the R.A.F. Pageant, £1,200 as a share of the Tournament at Olympia and £7,339 12s. 5d. from donations.

The total amount subscribed by R.A.F. Units at home and abroad was £1,073 9s. 9d. a certain amount of this being due to the fact that Armistice Day fell on a Sunday a splendid sum being collected at the Parade Services. Over £81 was the result of a boxing tournament at Aboukir and £86 from various sports at Cranwell and £50 from a Sports Fête at Henlow are amongst the largest Service subscriptions.

The expenses of administration are very low amounting to a total of £1,387 18s. 11d Grants in aid were £7,030 19s. 2d. and the expenses of Vanbrugh Castle £2,791 14s. 4d.

Subscriptions are still urgently required and may be sent to the Secretary, Lt.-Col. Burch, 7, Iddesleigh House, Caxton Street, S.W.1.

The India Command Re-union Dinner.

The Re-union dinner of the R.A.F. India Command took place at the Savoy Hotel in March. Air Vice-Marshal Philip Game was in the Chair and there were about sixty officers present. The toast of "The King and Emperor" having been honoured, Air Vice-Marshal Game made a short speech in which he suggested that the dinner should be made an annual event and that former officers of the R.A.F. who had served in the India Command should be invited to join. On a show of hands it was decided to adopt both these suggestions.

The Middle East Dinner.

The Third Annual Dinner of the Middle East Command, R.A.F., will take place at the Café Royal, Regent Street, on the evening of June 3. Air Vice-Marshal Sir Geoffrey Salmond, who commanded the R.A.F. in the Middle East during the greater part of the War, will preside

The re-union is for past and present officers of the flying services who served in the Middle East during the war.

On this occasion the principal guests will be Sir Samuel Hoare, Bart., M.P., and Major-General Sir Lewis Bols, K.C.B., K.C.M.G., D.S.O., who was Chief of Staff to General Allenby. Further particulars may be obtained on application to Flt. Lt. C. E. H. Medhurst, Air Ministry, W.C.2.

An Award.

At an Investiture at Buckingham Palace on Feb. 28 H. M. the King conferred the Edward Medal on George Livermore formerly of the R.A.F.

Livermore served in the Royal Air Force during the war and was discharged in 1919 with a disability pension, on account of a gunshot wound in the foot. He was undergoing a course of training in French polishing at the Enham Village Centre, Andover, and on Mar. 7, 1923, was, together with other disabled men, in a room where some beeswax mixed with turpentine was being heated on a stove. This caught fire, and Livermore, realising the danger, seized a walking stick, and with the crooked end lifted the blazing bucket and made for the door. His clothing was alight, but notwithstanding serious burns he gallantly made his way to the doorway, when he was compelled to drop the bucket When the fire occurred some of the men managed to escape through the windows, but all the men were in various degrees disabled and some were unable to escape. As it was, some of the men were slightly burnt, while Livermore himself sustained severe injuries, causing him intense suffering. He had to lose part of his left arm, while his right hand and arm were severely burnt. There is no doubt that Livermore realised the danger to his comrades if the building caught fire and without hesitation risked his life on their behalf

The Silent Service.

The following notices are extracted from the Times of Apr. 8 :—

After nearly four years in charge of the Air Section of the Naval Staff, Commander R. B. Davies, V.C., D.S.O., A.F.C., who has been succeeded at the Admiralty by Captain T. F. P. Calvert, D.S.O., is to join to-day the battleship "Royal Sovereign," of the Atlantic Fleet. This will be the first post afloat to be held by the V.C. since his promotion at the end of 1919, before which he was for eight months first lieutenant-commander of the battle-cruiser "Lion," then flagship of Sir Roger Keyes. In the war he won the D.S.O. for repeated attacks on German submarine and air bases in Belgium and the V.C. for gallantry in an air attack on Ferrijik Junction, Thrace, when he came down in enemy territory and rescued Flight-Lieutenant G. F. Smylie from capture, after the latter's machine had been brought down. The "Royal Sovereign" is expected at Sheerness to-day to give spring leave to her crew after the Mediterranean manœuvres.

Instead of one executive and one accountant officer on the Air Section at the Admiralty, provision is made in the new Navy Estimates for two executive and one accountant officers. Captain T. F. P. Calvert, D.S.O., and Paymaster Lieutenant-Commander Henry Rogers, O.B.E., now there, are accordingly to be joined to-day by Lieutenant-Commander E. T. R. Chambers, who, during the past three months, has been serving in the aircraft-carrier "Argus" Lieutenant-Commander Chambers went in for naval air work before the war, and during hostilities became a wing-commander, R.N A.S., and lieutenant-colonel, R.A.F., being in command of the air stations at Chingford, Dunkirk, and Vendome

Naval Co-operation.

Proposing the toast of "The Naval and Air Forces of the Empire," at the annual dinner of the Institution of Naval Architects on Apr. 9, the Duke of Northumberland said that the problems of Imperial defence had never been greater or more complicated than they were at the present day. The country was fortunate in having at this crisis in its affairs Ministers in charge of the Navy and the Air Force who had rendered distinguished services for the Empire.

Lord Chelmsford (First Lord of the Admiralty), responding, said that the Navy and Air Force had each much to bring to the other. The Air Force was able to bring all that great popular enthusiasm which was behind so splendid and young a body, and it could also bring to the Navy all the results of that concentrated study of the science of aviation which the Navy could not have had time seriously to study. On the other hand, the Navy could bring to the Air Force a long experience in technical problems which in many respects were going to confront the Air Force in the near future—the experience of a body of technical experts second to none in the world.

Brigadier-General Lord Thomson (Secretary of State for Air) said that the Air Force was the Cinderella of the Services. As to the relations between the Air Force and the Admiralty, he had always found that they were entirely sisterly. He had noticed very little of that jealousy which was associated with the elder sisters of Cinderella.

He asked men of light and leading, men of public spirit, and men of science to do all they could in the way of furnishing experience and advice to the young Air Force. Civil aviation was one of the most baffling problems that presented itself to-day. It was a highly speculative industry. It could not be run without large subsidies from the State.

In the Empire we had vast regions to conquer. We must have a heavier-than-air service linking up our business men and carrying our own mails to all parts of Europe; an airship service linking up all parts of the Empire and carrying mails and passengers to remote parts of the Empire which at present were separated by journeys occupying many weeks; and we must encourage individual flying. We would never maintain our supremacy as a World Power unless we were just as supreme, in a commercial sense, in the air as we had hitherto been upon the sea

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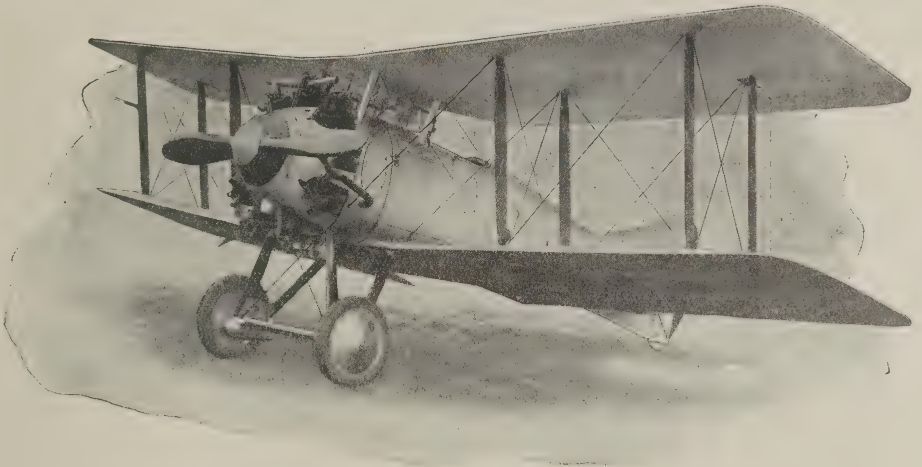

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,, ,, ,, ,, ,, 1923

RECORD CLIMB OF 19,500 FT. IN 11 MINS. 34 SECS.
HOLDERS OF BRITISH SPEED RECORD 212.2 M.P.H.

Illustrated Catalogue on application.

ACCIDENTS AND INSPECTION IN THE UNITED STATES.

As is probably well known the United States of America did not ratify the International Air Convention, and in that country there are at present no Air Navigation Regulations, no official inspection or licensing of aircraft, of pilots, or aerodromes. Anybody is perfectly free to take any kind of aircraft whereon he can lay hands into the air where and when he likes, and this freedom extends also to the carrying of passengers "for hire or reward."

Considering the state of affairs in this country, where a paternal Government treats a would-be pilot as an eminently suspicious individual, and practically prohibits anything of the nature of private flying, it might be imagined that the United States of America should form an ideal field for the development of a popular interest in flying and for rapid progress in civil and commercial aviation. Unfortunately this is not the case.

The American Government has not merely not attempted to restrict civil flying—it has made private aviation as cheap, as simple, and as dangerous as possible. When the late war in Europe came to an end America was as overloaded with surplus aircraft as was this country, and the American Government was faced with the problem of disposing of an enormous supply of aeronautical junk with the least possible loss to itself. Being however in a less stringent state of poverty than were its European associates it made no such serious attempt—as did Britain for instance—to obtain a reasonable market price for its surplus aircraft supplies, but set about getting rid of them at any price as quickly as possible, and so far as can be discovered what it could not sell quickly it dumped in heaps to rot.

In consequence it is possible apparently to go to any one of a large number of scrap-piles in America and—for the equivalent of about 9d.—to collect all the components, including the engine, of machines of the J.N.4. and similar prolific types. The components may then be assembled—loose bits being tied on with string and broken flying wires replaced by material lifted from the nearest fence—the tanks filled with petrol and oil and the attempt then made to take the machine into the air.

There is no particular reason why those who desire to commit suicide in this particular way should be deterred from so doing, but there is nothing whatever to prevent owners of machines of this class from taking up innocent and unsuspecting members of the public as paying passengers.

As a result of this state of affairs almost anybody can start up a joy-riding concern in America, and the country being so large it is quite possible for such a concern after it has killed a few passengers in one district and become unpopular there to move to territory which does not know its record and continue the work. As apparently a fess of $5 per passenger per flight is readily obtained in green districts and machines and their maintenance cost practically nothing, the business is a paying one while it lasts.

Flying concerns of this type are known in America as "Gypsy Fliers," and their activities are causing those who are seriously interested in aviation in America very much legitimate concern. According to the American Aircraft Year Book, 1923, there were in America between Oct. 11, 1921, to Oct. 11, 1922, 129 legitimate aircraft concerns—that is firms or individuals of fixed address and definite financial responsibility operating from 600 to 650 aircraft, which flew a total of nearly 3,000,000 miles. Among these there were twelve serious accidents leading to seven deaths. During the same period "Gypsy Fliers" are estimated to have operated approximately the same number of aeroplanes (550-600) over about the same mileage, and to have caused 126 accidents causing 62 deaths and 100 cases of injury. Of these accidents 46 were caused by faulty piloting; 36 by defective aircraft or engines, and 39 resulted from reckless stunting.

Under the circumstances it is not surprising that the legitimate aircraft concerns in America find it difficult to persuade the public that flying is reasonably safe or to make any sort of rapid progress in the development of Civil Air Transport. The Aircraft Industry is crying out for legislative action which shall safeguard the interests of responsible concerns and rule out the mischievous activities of the irresponsible Gypsy. The evidence seems to show that in course of time their cry will be heard and that regulation of civil aviation by the Government will shortly be established, along lines more or less similar to those in force in those countries which have ratified the International Air Convention.

On the face of it the facts as outlined above would seem to provide very strong arguments in favour of the very tight Government control over all civil flying which exists in this country to-day. Quite obviously it is eminently desirable that there should be sufficient control over aviation to secure the safety of the public. The present trouble in the United States however is not to be traced to absence of control alone. The fault in the first place lies with the Government itself in disposing of dangerous surplus aircraft to all and sundry buyers and the American Aircraft Industry is quite reasonably entitled to call upon their Legislature to clean up the mess for which it is ultimately responsible.

But they will be well advised to walk warily in this matter. American Government Departments, if one may believe the statements of American Aircraft Manufacturers, are just as non-moral as those of any other country. And if the American Aircraft Industry delivers the future of Civil Aviation wholly into the hands of a Bureau of Civil Aeronautics they may find that this last state is worse than the first. And if they will take a mild hint based on British experience let them move heaven and earth to secure the liberty of the private individual to break his neck in an aeroplane with the same freedom that is now allowed him in or under a motor-car.

ON THE WRIGHT T.-3 ENGINE.

The following communication has been received from Mr. G. J. Mead of the Wright Aeronautical Corporation :—

Recent articles in THE AEROPLANE, and particularly one on the Rolls-Royce Condor III by Mr. Sayers, have made certain incorrect and misleading statements as regards the Wright "T-3" aero engine. One would infer from these that the "T-3" was built for racing only, and had relatively low power output and inferior durability as compared to that of the Condor III. As these misstatements have obviously resulted from insufficient and inaccurate information, we wish to set forth certain facts which it is hoped will clear up any erroneous impressions which may have been established by these articles.

The "T" series of engine was not designed for racing. The original design was laid down for a 500-550 h.p. powerplant at low compression and low speed for bombers and seaplanes. These engines were called "T-2X" and had carburettors mounted below the lower crankcase. Following this model came the "T-2P," which in many ways was similar to the "T-2X," except that the carburettors were located in the Vee and detail improvements were made. A production quantity of these engines was purchased by the United States Navy for large flying boats and were all put into service with low compression pistons, i.e., 5.25 to 1. In the meantime, experimental models were being developed with higher power and the durability, already an outstanding feature, was steadily improved.

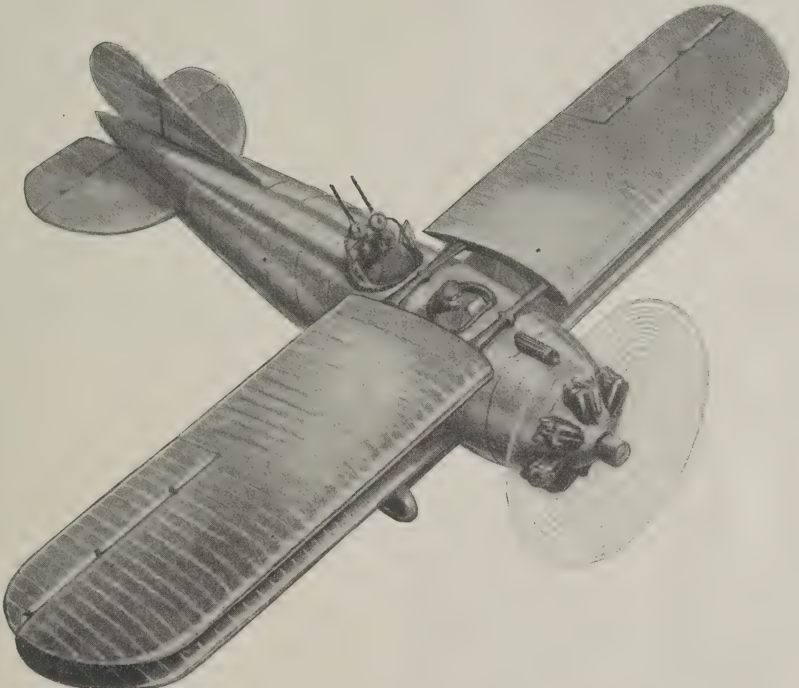
The "T-3X" was shortened considerably over the "T-2," and the cylinder blocks made lower, in other words, the frontal area as well as the space occupied was reduced. In addition, the whole design was revamped to provide ample strength as well as bearing areas for a 675 h.p. rating at 2,000 r.p.m. After passing overload duration tests successfully with from 750 to 775 h.p. it was decided to put two of these engines in the Pulitzer Race. The ships thus equipped, finished third and fourth with an average speed of 230 miles an hour for the entire 120 miles to their credit, and were, incidentally, the first racing effort of the Wright Company. Racing was, therefore, a mere incident in the development of this engine which has always been intended for large service ships. Its present small frontal area, which by the way is ten per cent. less per horsepower than any other engine now on the market, its low weight per horsepower and high power do make it a double purpose engine, so that it is now being supplied for single-seater fighters and fast two-seat observation planes, as well as bombers and flying boats.

The "T-3," which is now in large production, is rated at 675 h.p. at 2,000 r.p.m. for service work, and not 575 h.p. as incorrectly stated. The racing power is 750 to 775 h.p. and not 675 h.p. A 50 hour endurance test was successfully passed at this rating in less than 60 hours elapsed time. There were only two stops made during the run, one to replace a defective oil line and another to change some defective spark plugs. The engine was found to be in excellent condition at disassembly after the test. It is interesting to note that the engine developed 680 h.p. continuously for five hours at the end of the test. Since the valves were not ground or any repairs made on the engine during the whole 50 hours, the power output at the end gives an excellent proof of the good condition of the engine. The condensed results of this test are given below :—

ALL-METAL

AEROPLANES AND SEAPLANES.

Designers and Constructors of All-Metal Aircraft for the British Government.



As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

SHORT BROS.

(ROCHESTER & BEDFORD) LTD,

WHITEHALL HOUSE, 29-30, CHARING CROSS, LONDON, S.W.1.

Averages.	Cor. h.p. 2,000 r.p.m.	Fuel Cons. lbs./h.p./hr.
9/10 power running	602	.470
Rated power running	670	.528
Last 5 hrs. running	680	.548

M.E.P. developed on last 5 hours .... 138-1/2 lbs.
Oil consumption for 50 hours .... .0065 lbs./h.p./hr.
Weight of engine, dry .... 1,155 lbs.
Weight per horsepower .... 1.70 lbs.

As there seems to be some question as to the conditions of the American 50-hour endurance test, an extract is given from the latest United States Navy's Type Test Specification E-4D, dated April 28, 1923 :—

The engine shall be operated at rated speed for a total of 50 hours, divided into ten periods of five hours each; during the first 30 minutes of each of the first nine periods the engine shall be operated at rated power and speed; during the remaining four and one-half hours the engine shall be operated at nine-tenths rated power at rated speed; during the last and tenth five hour period, the engine shall be operated at full throttle and rated speed, developing the maximum power.

We feel that this is a more severe test than required by the Air Ministry, which is, roughly speaking, 49 hours at nine-tenths rated power and rated speed, followed by one hour at maximum power at rated speed. In the American test, the engine is operated for 19 per cent. of the time at or above the normal rated power, whereas in the British test, the engine is only operated for 2 per cent. of the time at or above normal power.

The diagram comparison of the Condor and the "T-3" published in the Mar. 12 issue of The Aeroplane was quite misleading, as the propeller hub was omitted on the Condor. As we build a geared model, a true comparison has been drawn up showing the Condor III and the geared Wright "T-3." There is considerable difference in length. Not only has the propeller hub been omitted from the drawing of the Condor, but apparently from the weight statement as well, so that a comparison with the "T-3" weight *complete* is certainly unfair.

In conclusion, we wish to point out that the Wright "T-3" engine is the result of eight years' aero engine building experience, including the development of the now famous "E-4" engine, which has passed the only successful full throttle 300 hour test we know of. Moreover, the "T-3" engine is not experimental as seems to be the case of the Condor III, but is in regular production. It has been put to all sorts of tests on the block, in service and in racing, and can be truthfully called a developed and durable product. A large number of the "T" series of engines have had over 200 hours of actual service flying. The engine is most emphatically not essentially a racing machine. The "T-3's" characteristics, however, do make it a particularly desirable powerplant for high speed, as well as load carrying ships, and its durability has been well proven by hours of satisfactory service work, both as a high and low compression engine.

[It is necessary to plead "not guilty" to certain of the charges of misstatement contained in the above letter. The statement as to the rating of the Wright "T-3" engine makes it clear that the engine can be used for heavy duty. As to the actual h.p. figures, current advertisements by the Wright Corporation bear the legend :—Ratings. T-3. 550 h.p. *heavy duty*, 650 h.p. *high speed*, and therefore one must place responsibility for any misstatement on the Wright Co.'s advertising department. From Mr. Mead's own letter it appears that these figures relate to the low-compression type of "T-3." It is fair to remark that the compression ratio of the Condor III is 5.3 against 5.25 for the low-compression Wright, so that the comparison is not unfair. No doubt the Condor III with increased compression ratio will give an increased output, but the standard Condor is designed for service use with B.E.S.A. Aviation spirit and a high compression ratio is not found to be conducive to long life under these conditions.

As to the omission of an airscrew boss from the outline of the Condor it is made clear in the article that the Condor is fitted with a flange for the direct attachment of a metal airscrew and not with a boss of normal type. A saving in overall length is attained in this way though that saving is less than the whole length of the normal boss. Incidentally the Condor III is in no way an experimental engine, but is now in active production.

The writer has no desire to belittle the Wright "T-3" engine. But so much has been written in this country as to our lack of modern engines possessing characteristics such as those of the "T-3" that it was felt to be desirable to show that allowing for the fact that the Condor III has only been produced as a low-compression heavy-duty type it was safe to assume that it could easily be modified to a high-speed engine for racing comparable to the "T-3.".—W. H. S.]

Italian Aircraft Progress.

Italian aircraft manufacturers are busy on various types of new machines. The Savoia firm has completed the S.57, a high-speed flying boat for long-range sea-work, which is claimed to be the most successful single-engined flying-boat yet produced for the purpose. With a 260 h.p. Isotta-Fraschini engine and carrying a crew of two, wireless gear, camera, electric lighting, and one forward machine-gun, it has a maximum speed of 137.5 m.p.h. and a climb to 6,556 feet (2,000 m.) in 8 mins. 12 secs., and to 13,120 feet (4,000 m.) in 28 mins. 12 secs.

They are also completing the S.55, a twin-engined, twin-hulled monoplane flying boat for torpedo work. The hulls are of the short N.C.4 type the tail being carried on outriggers. The engines (two 300 h.p. Fiat A.12 bis) are mounted in a single nacelle above the centre of the wing and drive pusher and tractor airscrews.

The Piaggio firm has successfully tested its single-seater pursuit monoplane and is completing a dual-control light aeroplane which will be fitted with a two-cylinder engine of 18 h.p. designed by Ing. Pegna.

The Cantieri Navale di Monfalcone and the Italian Dornier Co. are producing special types of seaplanes for the Schneider Cup and at the former factory a three-engined flying boat is in course of construction to the designs of Ing. Conflenti.

Experimental work is being continued at the Government Aircraft Factory (Stabilimento di Construzione Aeronautiche di Stato) where work is in progress on the construction of airships of 1,000, 6,000, and 45,000 cu. m. capacity. An airship of 120,000 cu. m. capacity has been designed and will shortly be put in hand.

A helicopter built by the Genio Aeronautico is to undergo its first trials almost immediately.

A very powerful wind tunnel is being built to the order of the Government and research is spreading everywhere.

Tenders for the construction of new types of aeroplanes, aero-engines, parachutes, etc., are invited.

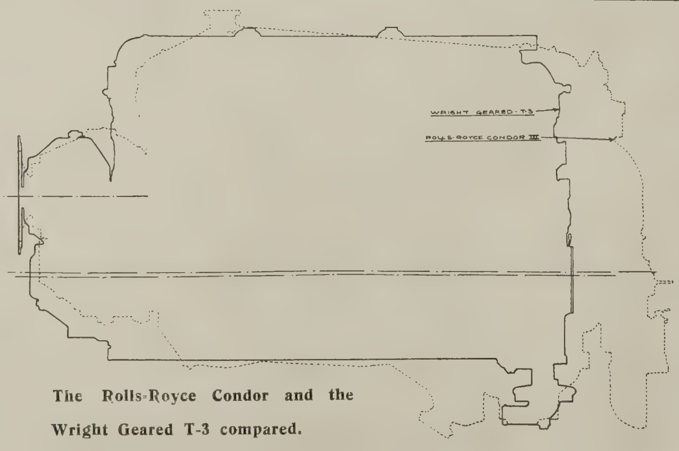
Several representative types of aircraft of the latest models have been purchased abroad in order to study new methods of construction and this information will be available to the Italian Aircraft Industry.

These foreign purchases include a Dewoitine D.1.C.1. all-metal single-seat fighter monoplane, a Nieuport Delage 29 C.1. single-seat fighter biplane, a Breguet 19 A.2. all-metal two-seat reconnaissance fighter, a Breguet 19 B.2. bomber, a Spad 81 C.1. single-seat fighter, a Fokker D.XI (300 h.p. Hispano-Suiza) and a Fokker D.XIII (450 h.p. Napier Lion) both single-seat fighters.

Engines purchased include the Rolls-Royce Eagle IX, the Bristol Jupiter and the Curtiss D.12.

Long-Distance Lubrication.

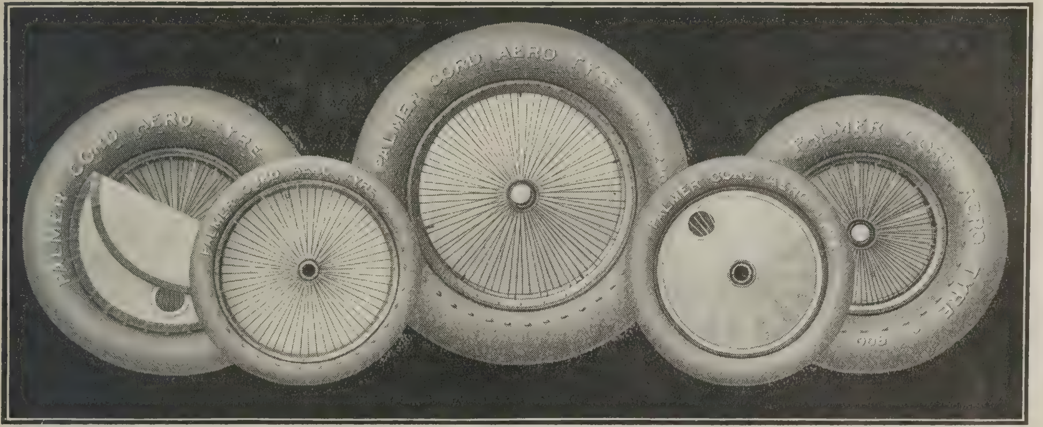
In connection with the recently recorded accomplishment of 100,000 miles of flying in 1,000 hours by one Napier Lion engine (number 24332) in a D.H.34 belonging to the Instone Air Line, it is of interest to note that throughout the whole of the run the engine was lubricated with Wakefield Castrol Oil.



The Rolls-Royce Condor and the Wright Geared T-3 compared.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	161*	185.	55.	135/50
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	150	185.	55.	Central
,,	167	185.	55.	125/60
,,	174	250.	80.	Central
1000×150	201	185.	60.32	125/60
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 161, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.*

†Wheel No. 169 is fitted with Ball Bearings.

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S/NK (240)

Aircraft Manufacture in Spain.

It is reported that the Sociedad Españôla de Trafico Aeros, which up to now has confined its efforts to running the Seville-Larache air service with D.H.9cs and also a Governmented contracted school at Carabanchel, near Madrid, has acquired rights for constructing Fokker aircraft in Spain.

Under existing regulations preference is given by the Spanish War Office in all aircraft contracts to tenders submitted by Spanish firms.

The capital of the company is stated to be 1,000,000 pesetas (£32,000) and at present it only possesses facilities for the assembly of aircraft.

At present it is engaged in assembling 20 Fokker C.IV reconnaissance biplanes (375 h.p. Rolls-Royce Eagle engines) which have been purchased by the Spanish Royal Air Service, and the company hopes in the future to be able to undertake the complete manufacture of aircraft in Spain.

Aero-Nautical Instruments.

Presumably everybody who is interested in aviation, or at any rate everybody who has to make a livelihood out of it, is interested to a greater or lesser degree in the instruments which are used for aerial navigation. Hitherto there has been no publication which gives in a concise and easily understandable form a general knowledge of the instruments which are used for this purpose. This undoubted want has now been filled by Mr. A. J. Hughes, O.B.E., who has produced in a very handy form a book entitled "Instruments for Aerial Navigation."

Mr. Hughes is a director of the firm of Henry Hughes and Son Ltd., the famous manufacturers of nautical, aeronautical, optical and drawing instruments, of 59, Fenchurch Street, E.C.3, and although his book naturally is chiefly concerned with the products of his firm it is none the less highly informative, for the good and sufficient reason that Henry Hughes and Son Ltd. make instruments of every kind required for air navigation. The book has been compiled by Mr. Hughes in collaboration with a practical flying man of considerable experience and its most important feature is the way in which it explains the method of using the various instruments.

Starting with the discussion of the compass Mr. Hughes describes the type of compasses specially suited for seaplanes, scout machines, and airships, for the use of observers as well as pilots. After which he describes the Aperiodic compass and the Dead-Beat type, and in the same chapter deals with the Gyroscopic Turn Indicator, as being a useful aid to the compass by letting the pilot know when he can trust his compass and when he can not.

The second chapter is devoted to instruments for the estimation of drift such as the Drift Bearing Plate or Pelorus, the Wimperis Course-Setting Sight and the Husun One Point Position Indicator, and the Course and Distance Calculator. The third chapter deals with instruments for determining position such as the various types of sextants, chart boards, protractors and so forth and included in it is that interesting implement known as the Cave-Browne-Cave Goggle.

Chapter IV deals with instruments for artillery, which apply also to aircraft as being a form of artillery, these including the Aldis Sight and its modification the Aldis Camera Sight. Last of all come instruments for the measurement of height, speed, level, time and temperature, such as the Altimeter, Revolution Counter, Air Speed Computer, Clinometers and so forth. These also are of quite considerable interest not only to the pilot of every aeroplane but also to those who habitually travel as passengers on their lawful occasions.

Any such persons can employ a couple of hours very usefully in studying Mr. Hughes' book, which may be obtained at two shillings and sixpence per copy from the firm's Nautical Book Department at 59, Fenchurch St. E.C.3.

A Change of Address.

Those who are interested in aircraft insurance will do well to note that the Union Insurance Society of Canton Ltd., which seems in these days to be doing a very large proportion of the total amount of the World's air insurance, is now located in new office premises at Union Building, 78, 79 and 80, Cornhill, London, E.C.3. The firm's new telephone number is Avenue 8662.

A very pleasant informal gathering to view the premises and to wish the Society prosperity in its new abode was held on Mar. 28 when the various pleasing personalities who deal with the firm's air insurance business entertained their friends in the Aircraft Industry with their usual hospitality.

Good Business.

Considering the prevalent complaint of bad trade it is eminently satisfactory to see the ancient firm of D. Napier and Son Ltd. issuing a balance-sheet which under all circumstances must be considered extremely satisfactory. The year's trading ending on Sept. 30, 1923, shows a net profit of £98,448 10s. 6d. This permits of the payment of £22,500 as dividend on the Preference Shares. The Directors are appropriating a further £22,500 to replacing that sum which was taken from the General Reserve in 1920 and £50,000 to replacing that sum taken from the General Reserve in 1922. Adding the balance brought forward from last year there is now a sum of £11,401 19s. to carry forward to next year.

The Directors report an increase in sales both in Napier cars and aero-engines. They also report that the 1,000 h.p. Napier engine known in the R.A.F. as the Cub has successfully completed the strenuous British Government type test. As this is the highest powered aero engine to have passed such a test it is rightly acknowledged to be an important achievement for British engineering. Further the Directors report that important developments in connection with the company's productions are in progress.

In view of the good service done to the progress of British aviation by the Napier firm all will hope that the progress shown during the past year may continue in the future.

Real Motor-gliding.

A meaning has at last been found for that much misused word "motor-glider" for no other word can adequately describe the new 40/50 h.p. Napier car. On a recent Sunday accompanied by Mr. F. H. Jones of D. Napier and Son, Ltd., one experienced a run in this model. The route chosen was the Eastbourne road and the day being cold and the car open Mr. Holloway, the driver, kept the speed down to about 30 m.p.h. at which speed most of the journey was made except for a stretch over which the Napier was challenged by an Aston Martin driven as only Mr. Martin himself can drive.

When going full out one imagined that the Napier was doing about 50 m.p.h., but one was surprised to note that on the speedometer which had just been calibrated the needle was hard over at the 70 m.p.h. mark which was as far as it would go. Owing to the wonderful smoothness of the Napier motor-glider there is absolutely no sensation of speed as might be expected from 70 m.p.h. on the open road.

There is no doubt that the new Napier is one of the finest all-round cars on the road and is making a bid for the supremacy on the road which the Napier Lion holds in the air.

Globe-Trotting Accessories.

The following accessories and condiments are assisting Sqdn.-Ldr. Maclaren in his attempt to fly round the World :—

Smith's Yet Again.

The instrument equipment installed on the Vulture is composed entirely of units supplied by S. Smith and Son Ltd. The instruments include Tachometer, Air Speed indicator, Oil and Fuel gauges, Radiator thermometer, etc.

K.L.G. plugs are also used on the flight. Incidentally a certain pilot with a very bad memory and a somewhat mixed mind was trying to recall the name of K.L.G. plugs. Remembering the firm's slogan "All were available, K.L.G. were chosen" described them as the "many were called but few were chosen plug."

Fuel and Oil.

Squadron Leader Maclaren elected to use Shell Aviation Motor Spirit, which was also used in the flights across the Atlantic and to Australia He will also use Shell Motor Lubricating Oil throughout.

Organising a world-flight, such as this, is by no means so simple a matter as may be imagined. A chain of petrol and lubricating oil supply dumps has had to be established all round the world, and this work has not been without incident. The Shell Company, who have placed their organisation at the service of Squadron Leader Maclaren for the purposes of putting down these dumps, and whose petrol and lubricating oil are being used exclusively by the British expedition, had their arrangements upset by the Japanese earthquake, and new measures had to be devised at short notice.

Dumps of Shell Spirit and Shell Motor Oil had to be established in the almost uninhabited Aleutian Islands, a task with no small amount of risk, and one which might have proved an almost insurmountable difficulty but for the splendid co-operation of the Canadian Government, with whose help a vessel was specially chartered.

It is interesting to note that, whilst Britain is represented in the flight by only one machine, with no financial co-operation upon the part of the Government whatsoever, America, engaged in the same enterprise, is solidly behind her four aviators, already on their way. All expenses are being defrayed by the American Government, and their Army and Navy have sent groups of officials to different points en route, in order to assure there being no hitch in the necessarily involved arrangements.

Dope.

The dope used has been supplied by the British Cellulose Company Ltd.

New Company.

George England (Sales), Ltd. (196-748).—Private company. Registered Mar. 27. Capital £5,100 in 4.500 preference shares of £1 each and 12,000 ordinary shares of 1s. each. To adopt an agreement with George England (1922), Ltd., and to carry on the business of mechanical, motor and electrical engineers, contractors for, manufacturers, builders, repairers, exporters and importers of and dealers in engines, motors, motor cars, vehicles, and aeroplanes, and spare parts, accessories, bodies, materials and appliances, etc. The subscribers (each with one ordinary share) are :—G. G. T. Simpson, B.A., Oxon, 18, Inglis Road, Ealing Common, W.5, motor engineer; C. O. C. Reilly, M.B.E., B.Sc., Haddiscoe Hall, Norwich, engineer. The subscribers are to appoint the first directors. Qualification : 200 ordinary shares. Remuneration as fixed by the company Solicitors : Beckingsales and Naylors, 34, Copthall Avenue, E.C. Registered office : 11, Curzon Street, Mayfair, W.

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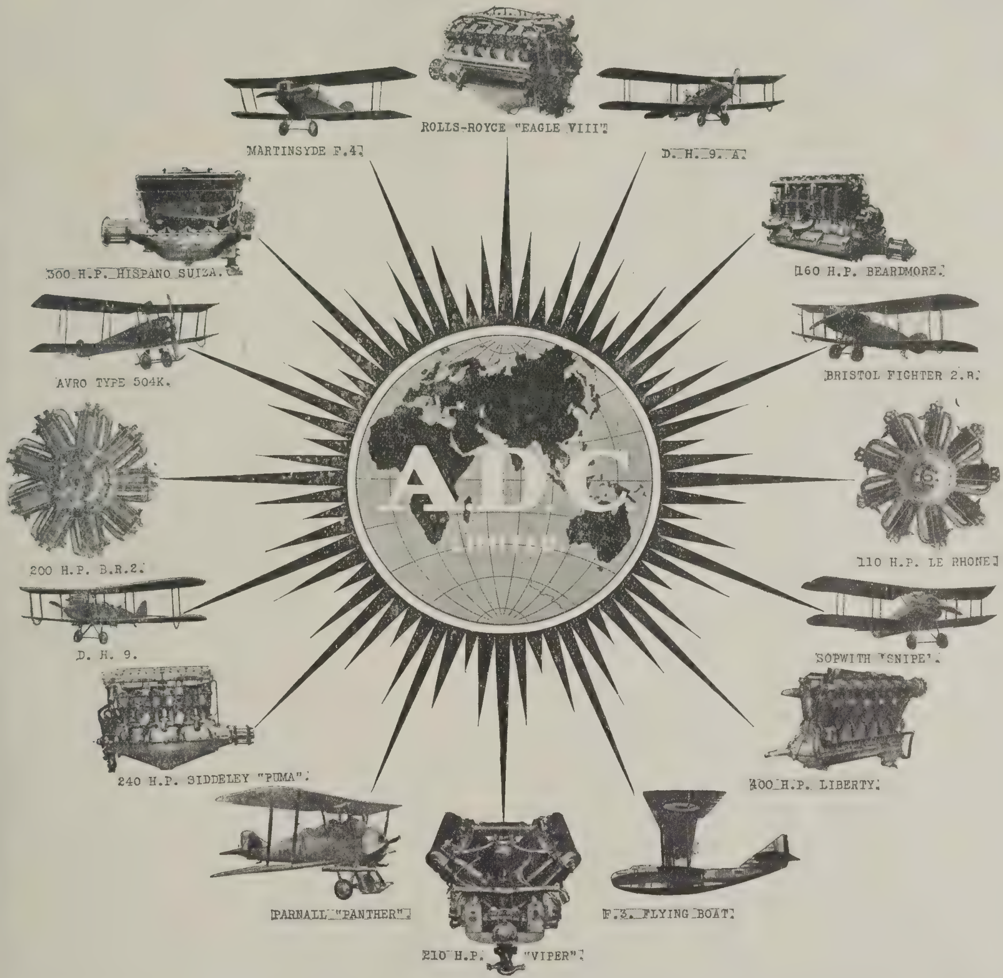

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 2; Tuesday, 2; Wednesday, 10; Thursday, 9; Friday, 5; Saturday, 7; Sunday, 2.

Paris—London:

Air Union, machines 25; passengers 120; freight — lbs.

London—Rotterdam:

K.L.M., machines 10, passengers 34.

Special Machines:

De Havilland Aircraft Co., Ltd., machines 2, passengers 2.

Total number of trips by British machines: 2, carrying 2 pas. Foreign machines: 35, carrying 154 passengers.

Comparative Figures:

For week ending April 20:

Machines, 37; Passengers, 156; Crews, 61; Total personnel, 217.

Corresponding week, 1923:

Machines, 93; Passengers, 366; Crews, 153; Total personnel, 519.

Corresponding week, 1922:

Machines, 96; Passengers, 171; Crews, 149; Total personnel, 320.

Corresponding week, 1921:

Machines, 55; Passengers, 183; Crews, 70; Total personnel, 253.

Corresponding week, 1920:

Machines, 44; Passengers, 46; Crews, 46; Total personnel, 92.

Croydon Notes.

Owing to the continuance of the dispute no British machines have operated and what under normal circumstances would have been a boom week to the financial advantage of the employees of the new company has been a dead period so far as British Air Line work is concerned.

On Wednesday Mr. Alan Butler and a mechanic passed through the aerodrome on the D.H.37 *en route* for Paris, the Riviera, Italy, Belgrade, Sofia, Bucharest, Vienna, Prague, Warsaw, Berlin and Rotterdam. This will be Mr. Butler's first long trip though he flew to the Riviera and back three years ago. He hopes to be back in about six weeks. He arrived at Lyon on Thursday and started for Nice on Friday but had to return to Lyon because of engine trouble.

Mr. Dickinson passed through the aerodrome on Thursday on a D.H.9 bound for Paris.

The only other above-ground sign of British aviation was a test flight on Tuesday by Mr. Perry on the D.H.9 G-EBEN belonging to the Aircraft Disposal Company Ltd. This machine is a single-seat mail-carrier.

The Manchester Aerodrome Muddle.

The aerodrome situation in Manchester seems to be pretty nearly as muddled as the aerodrome situation in London. Apparently there is only one possible aerodrome in the Manchester district and that is the one at Alexandra Park. The Air Force wants an aerodrome there for the use of one or more of its Auxiliary or Special Reserve Home Defence Squadrons. Also last year A. V. Roe and Co. Ltd. were discussing with the Air Ministry the formation at Alexandra Park of a school for pilots of the Royal Air Force Reserve similar to the schools which are being run by various firms at Stag Lane and Renfrew and Bristol and Coventry. Also Alexandra Park has been used as its Manchester terminal by the Daimler Airway and it will presumably be required by the Imperial Airways Ltd. in due time. Furthermore the De Havilland Company want to use the aerodrome in connection with the proposed Plymouth-Birmingham-Manchester-Belfast air line.

Unfortunately Alexandra Park has a very considerable value as a building site and nobody concerned with aviation seems to be rich enough to save it from the builders. The ground actually belongs to Lord Egerton of Tatton. The present holder of the title was well known to the pioneers of aviation as the Honourable Maurice Egerton who at one time had several quaint and interesting experimental machines built by Short Bros. at Eastchurch. Of late years Lord Egerton has not taken any practical part in aviation and though doubtless his early affection for flying would prompt him to present the Alexandra Park site to the City of Manchester to be used as a municipal aerodrome the unfortunate fact remains that under existing laws the richest possible man cannot afford to be generous when he is called upon to pay the enormous death duties now enforced. Therefore if Alexandra Park is to survive as an aerodrome somebody will have to buy it.

The Manchester Chamber of Commerce has recently been discussing the question and so far from recommending the purchase of the aerodrome by the City of Manchester it has actually decided that it cannot even recommend the running of the Manchester-Belfast air line as there is not in its opinion a sufficiently large offer of air traffic to make the line pay. The Manchester Guardian says:—

> The view of the Chamber is that such air services are most valuable and should be encouraged but it holds that they should be backed by the resources of the State rather than left to private enterprise.

One would have thought that such extremely individualistic people as the business men who compose the Manchester Chamber of Commerce would be the very last people in the World to express such an advanced Socialist sentiment. But it is wonderful how socialistic the individualist can become when he is asked to pay for anything out of his own pocket for the benefit of the community.

As the position stands at the moment it seems that the fate of Alexandra Park depends on a competition between the Air Ministry, who will have to incite the Treasury to further expense, and the building trade (jerry-builders or otherwise) of Manchester.—C. G. G.

The Belfast Air Service.

Owing to the lack of Mancunian foresight Mr. D. M. Greig has elected to run the Belfast Air Service from Liverpool instead of from Manchester. The cause of the change is because of the aerodrome trouble at Manchester. Thus Manchester loses its position of the main air port of the North of England and is succeeded by Liverpool.

The service will begin on Apr. 30. De Havilland aeroplanes will be used and contracts for full loads for six months have already been obtained on the outward trip on which there will be no room for passengers. There will however be room for passengers on the journey from Belfast and fares will be announced shortly.

K.L.M. Extensions.

The K.L.M. service as from to-day Apr. 23 will be extended to Copenhagen. A machine will leave Rotterdam daily (Sundays excepted) at 09.00 hrs. going via Bremen and Hamburg. It is due at Copenhagen at 15.30 hrs. From Copenhagen there is an excellent night train service between Stockholm and Christiania.

The return journey is begun from Copenhagen at 09.15 hrs. and the machine arrives at Rotterdam soon after 17.00 hrs.

The fares are as follows:—London-Rotterdam £4, Rotterdam-Hamburg £4, Rotterdam-Copenhagen £6 5s., London-Copenhagen £10 5s.

The goods tariff to Copenhagen from London is 1s. 8d. per lb. with reduced rates for over 100 lbs.

A Successful French Air Line.

In 1923 the Latécoère Air Line operating between Toulouse and Casablanca carried 2,910,619 letters weighing 62,835 kgs., 1,410,052 being carried from Casablanca to Toulouse and 1,294,219 in the reverse direction.

The number of passengers carried was 1,279 and the year was devoid of accident of any sort involving personal injury.

The following figures for the period 1919-1923 show that the value of an air mail over long distances is fully realised by French business men:

1919, 9,124 letters (156 kgs.). 1920, 182,061 letters (3,252 kgs.). 1921, 327,805 letters (6,337 kgs.). 1922, 1,407,352 letters (34,167 kgs.). 1923, 2,910,619 letters (62,835 kgs.).

French Air Line Trouble.

M. Bouilloux-Lafont, Deputy for Finisterre and Reporter of the Aviation Budget, recently contributed an article to a Paris newspaper on the difficulties that are being encountered in working the French air line from Paris to Constantinople, which, it was hoped, might have become a French air mail route to India.

M. Bouilloux-Lafont states that the air port at San Stefano, near Constantinople, on which a considerable sum of money had been expended by the French Ministry of War, was abandoned on the evacuation of Constantinople by the French Army of occupation under the Treaty of Lausanne. He criticises the Government for having engaged in this expenditure without previously assuring themselves of their title to the property.

The writer also referred to the refusal of the German Government to allow French aeroplanes to pass over German territory on their way from Strasbourg to Bucharest, and remarked that ten French aeroplanes had been confiscated by the Germans since May 18 last. Since that date, in spite of the diplomatic representations, none of these aeroplanes had been surrendered and negotiations on the subject between the French and German Governments appear to have had no result.

New Companies.

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Edited by C. G. Grey

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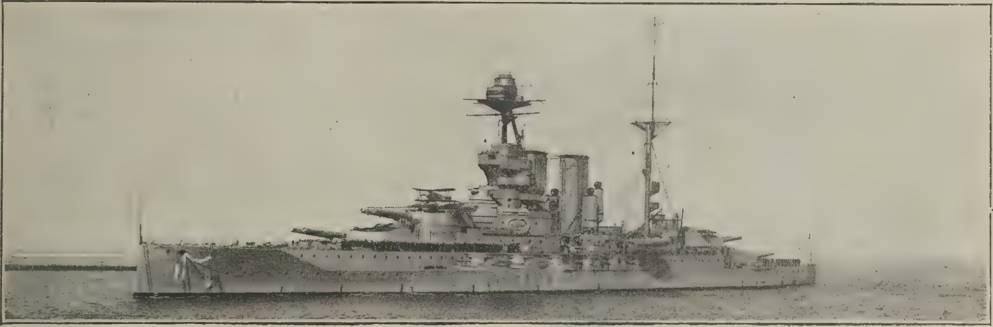
DETAILED FOR THE NAVY.



NAVAL CONTROL:—H.M.S. Malaya coming into the harbour of Valetta with a Fairey Flycatcher on a gun-turret launching-platform. It may be noted that the machine is without a tail and was apparently mounted on the turret rather to create an impression on the Maltese than with any idea of controlling the air.

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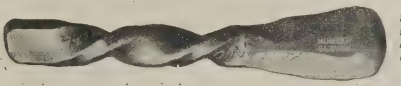

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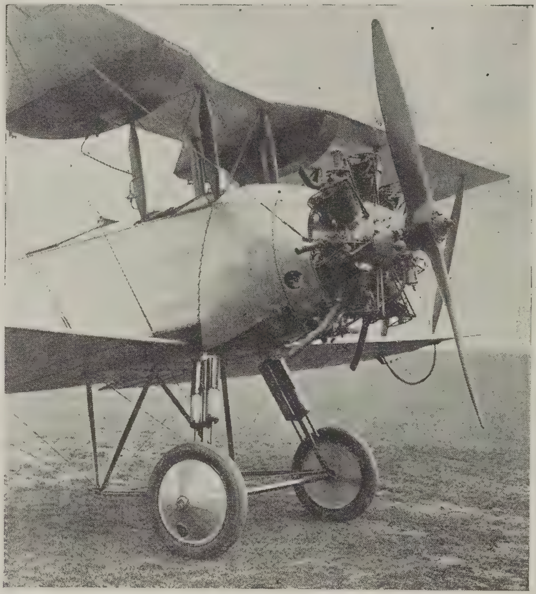

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ON THE ADMIRALTY'S ORDER.

Elsewhere will be found as nearly as may be the text of the Admiralty Order issued on Apr. 25 asking Naval Officers to volunteer for the Naval Air Work of the Fleet. One wishes the Admiralty joy and one hopes that their effort will meet with success. On previous occasions when Naval Officers have been asked to volunteer for flying duties the response has not been exactly enthusiastic, though one would have thought that intelligent beings would have leapt at the opportunity of getting away from the routine work of a ship and the conversation of a ward-room to a Service which is already recognised officially as our First Line of Defence and must obviously in the next war control the Senior Services. And those who volunteered were not invariably satisfactory.

There is a sad story which illustrates the difficulties of cordial co-operation between the Navy and the R.A.F. On a certain occasion a unit of the Royal Air Force which specialised on Naval Co-operation was engaged in manœuvres with a portion of His Majesty's Navy. After a spell of scouting the Admiral complained to the Officer Commanding R.A.F. that the observations were futile—or words to that effect. Whereupon the O.C. Air Force changed his observers and tried again. This time the Admiral raised still more complaints about the unreliability of the observations. So once more the observers were changed. For the third and last time the Admiral damned R.A.F. observers in heaps and thereafter sent in a stinging report to the Admiralty about people who could not recognise a war-ship when they saw one, and the general hopelessness of a Service which had not been weaned on salt water and tar. And he emphasised the fact that the third lot of observers were very much worse than either of the others. At any rate that was more or less his attitude.

The Admiralty sent the report to the Air Ministry with a more or less polite request for an explanation. And the Air Ministry passed it down to the O.C. that R.A.F. unit.

The R.A.F. officer replied in proper official language that he was desolated, he desired to apologise in three positions, and that he admitted being guilty of a grievous error; but that seeing as how the reverend Admiral had been so upset over the two attempts of his poor little humble R.A.F. observers (who *en passant*, he remarked, had not in fact been so frightfully inaccurate) he had replaced them entirely at the third attempt with full-blooded bred-in-the-bone brought-up-at-Dartmouth Naval Officers who had passed through the full Observers' Course of the R.A.F. and had been appointed to his unit because of their ingrowing knowledge of everything about the Navy—judging by their normal conversation, as he himself did not profess to know much about ships as such. He was frightfully sorry and all that, but would the Admiralty please forgive him for not knowing that Naval Officers could not recognise the ships of their own Navy.

Unhappily one has no means of learning what Their Lordships of the Admiralty thought about it and probably it is as well that one cannot report what they said about it. But one gathers that an atmosphere of sunny cheerfulness pervaded the Air Ministry for several days after the reply to the Admiralty had passed through its gloomy halls.

The Admiralty Order seems to explain itself fairly well. The periods of attachment of N.Os. to the Fleet Air Arm seem a trifle quaint. Two years of General Naval Service after only four years of air training ought to be just about enough to allow the N.O. to forget the little he had learned in the four years. And it seems a waste of the time of R.A.F. instructors to pass fifty per cent. of the partially-trained N.Os. back to Navy work.

The proviso that officers who volunteer for the first four years will not be required to do a subsequent period of air work without their own consent is a trifle pathetic. It shows how very little trust the Admiralty puts in the ability of its own officers to choose their own careers and the doubt that it feels itself about the suitability of N.Os. for air work.

Also it is rather pitiful that the Admiralty should have to offer a bribe of six shillings a day to N.Os. as an inducement to take to the air. The Navy is as well paid as is the Air Force, though of course not so well as air-line pilots, and it would seem as if the opportunity of learning the most modern of all methods of war should be sufficient inducement.

The Admiralty mentality is beautifully indicated in the paragraph :—

> There can be little doubt that with the continued development of Naval air work air questions must enter more and more largely into Naval Staff work, and a knowledge of such questions obtained by actual experience of air duties, must become a very valuable asset for a War Staff Officer, even if it does not become a necessity.

Truly the Admiralty is a strange institution. Still it is something to the good to know that it has a War Staff and knows the phrase " staff work " even if it be doubtful as to all that it connotes. Before the War 1914-18 the Navy had no staff.

That consistent *laudator temporis acti* the Naval correspondent of *The Morning Post* does his best in his persuasively eloquent way to induce N.Os. to volunteer for the Fleet Air Arm. But one feels sure that he did not intend to be quite as cruel to his beloved Navy as he appears to be when under an arresting cross-heading he says :—

> UNSOUND AT THE TOP.
>
> The matter is less serious in the subordinate ranks, where officers' immediate duties will generally be well defined, but it is as we go up the scale that we find the most serious defects in the present situation.

One may perhaps have hinted oneself that the Navy was a trifle calcareous at the top, but one had never said that it was unsound. Even when one has referred to bone-headed admirals and to senior officers who were solid ivory from the eyes upwards one has at least given them the credit for solidity. For the matter of that one has opined that the constitution of the Navy was sound rather than sense.

A little later in his article the aforesaid Naval Correspondent says :—

> The argument that few senior naval officers have flying experience is not sufficient reason to place the control of the Fleet's air arm under Royal Air Force officers either without naval experience or long since dissociated with [presumably he means "from."—ED.] the Navy. In the war there were a number of naval officers of standing who acquired very considerable knowledge of sea-air work. Some of these are still serving, others have but lately retired. It is from these sources that officers should be selected *now* to build up the great Sea-Air Service which will be the Navy of the future.

The man has the root of the matter in him, for he is capable of foreseeing the great Sea-Air Service of the future. Only he ought to have put it Air-Sea Service, because the sea-going craft is so amazingly limited in its scope. But, Heaven help us! Would he seriously bring to the Fleet Air Arm the former N.Os. who have left the Air Force?

One can remember one or two N.Os. whose departure was a loss to the R.A.F. But the majority of those who came from ships to the Royal Naval Air Service were, in the Navy's own expressive phrase, " washed ashore from the Fleet " because they were no good to the Navy. And after the War they left the Air Force very much for the Air Force's good. Some had nasty habits. Few had much intelligence. And still fewer had acquired any real knowledge of the uses of aircraft in war, or of the potentialities of air war at sea.

The Navy may well pray to be saved from its friends if such are the best suggestions that can be made for the improvement of the Fleet Air Arm. One would like to see the British Navy holding the command of the oceans as it did in 1914, and as it does to-day so long as it is not opposed by adequate air forces. But one fears that mentally, largely by reason of its educational methods, it is incapable of holding its position. And therefore the sooner it makes way for a younger Service with more modern ideas of war the better will be the position of the British Empire.

Nevertheless, the Air Ministry is prepared to give the Navy a fair run for its money, and one believes that the Admiralty Order as issued has been agreed by the Air Council. If sufficient N.Os. can be found to volunteer for the 54 situations in the first course at Netheravon one hopes that the personnel of the R.A.F. will likewise give them a run for their money. After all they are British officers of their kind and the fact that they have volunteered for air work marks them as being of intelligence superior to other N.Os.

A humorist once remarked :— " Do not let us be too hard on the Americans. After all they speak much the same language as ourselves, albeit through a different feature." Similarly, do not let us be too hard on the N.O. After all he thinks much the same thoughts as ourselves, albeit with different material in his cranial cavity.—C. G. G.

PROGRESS IN CIVIL AVIATION.

By C. G. GREY

During the past week two events have occurred which mark real steps forward in British Civil Aviation. The first was an exposition in far too modest a manner of the new De Havilland Type 50 with automatic wing-flaps and the other was the demonstration before a diminutive public of the three-engined Handley Page. Both these machines are described elsewhere in this issue by Captain Sayers in a properly technical manner and consequently one is concerned here with the effect of the mechanisms rather than with their causes.

In these days, apart from uneconomical running costs, the only real impediment to success in Civil Aviation is the danger of forced landings. Among those concerned with commercial flying there are two schools of thought. There are those who argue that forced landings should be made impossible by the production of infallible engines. And there are those who argue that a machine should be able to land anywhere without damaging those on board. These two schools are again divided against themselves each into two subsections.

In the first school one section believes that safety may be found in machines each with a single engine so perfect that it will never stop till its driver wishes it to do so. The second section believes in a multiplicity of engines so disposed that if one engine out of two or three, or two engines out of four or five, should stop the remaining engines will carry the machine to a safe landing place, for preference the next licensed aerodrome on its particular air line.

The first section argues that a multiplicity of engines means a multiplication of details which are likely to go wrong: as for instance that three engines each with twelve cylinders each with two sparking plugs means seventy-two possible chances of plug failure as against twelve chances in a huge six-cylinder engine of the same power as the total of the three and with two plugs per cylinder. To which argument the other side reply that if three or four plugs go wrong in their thirty-six cylinders it makes practically no difference and that if a whole engine fails they can still carry on with the other twenty-four cylinders. And they add that if the first section's argument is right the logical thing to do is to have one single cylinder with one single sparking plug as infallible as the Pope.

In the second school of thought one section wants machines which in case of engine stoppage will land like parachutes with a vertical drop which may smash the machine on bad ground but cannot do serious harm to the inmates. It must therefore have a very slow gliding speed and it must not stall and do a nose dive under any conditions, and it must be under perfect control till it actually hits the ground. The other section does not seem to care how fast the machine lands or how far it has to glide before landing so long as it pulls up quickly after touching the ground.

Apparently this second section forgets that a machine which lands with the velocity and decision of a falling brick may hit some obstacle within a few yards of landing which will break it up and kill the inmates before it has completed the run of a hundred yards or so on the ground which would normally bring it to a standstill. And if a machine has a long slow glide which, in the language of aerodromes, makes it " kite for miles " before getting onto the ground a slight error of judgment on the part of the pilot or an enforced attempt to get into a small field over trees may result in the machine with its stopped engines gliding gracefully at forty or fifty miles an hour into a tree or a wall or a house and squashing the people in the nose of the machine and possibly setting fire to the wreck.

The Unattainable and the Attainable.

Now of all these sections it seems that the infallible engine section may be put out of court at once. After a century of experiment we have not yet achieved an infallible railway locomotive nor an infallible steamship engine. And in spite of the cerebral hurricanes of our dome-browed metallurgists we are still a whole city of streets away from an infallible aero-engine, as has been demonstrated forcibly in numerous long-distance flights of late.

Therefore it seems that in a multiplicity of engines there is safety, much as in a multitude of counsellors there is wisdom. And, partly because there is luck in odd numbers and partly because odd numbers must always give a majority, it seems wise to have either three or five engines so that if one engine fails the pilot may be able to keep his machine in the air with a majority of his engines in his favour, though knowing that he had better resign onto the ground at the first suitable opportunity. Also, because there is something in the proverb that too many cooks spoil the broth, and because a multiplicity of parts does increase the odds in favour of one or other of the parts failing, one is rather disposed towards three engines instead of five.

If one of three engines fails the pilot will certainly land as soon as possible and so may avoid a serious accident which might be caused by a half-dead engine churning round and gradually breaking its internal economy into small pieces. With four engines running out of five he might be tempted into a disastrous attempt to finish his scheduled journey.

Therefore on the whole one gives all one's votes to three-engined machines in which any two engines provide more than half the normal full power even though they may not give quite two-thirds of it. Which is why one regards the new Handley Page as being the most important step in the right direction which has been made in British Civil Aviation up to the present so far as the arrangement of engine-power is concerned.

Getting Down.

Now, even given the additional safety guaranteed by three engines instead of one or two, one still holds that the quality most of all to be desired in an aeroplane whether Service or civilian is the ability to get down anywhere without killing anybody. If the engine of an automobile stops one can at least get out and walk. If a railway locomotive breaks itself the train remains on the line, unless as has happened a broken side-bar churns up the permanent way and de-rails the appended coaches. If a steamship's engine stops the ship will remain afloat unless she drags her anchor onto a lee shore. But if the power-plant of an aeroplane ceases to operate then the machine has got to come down as certainly as had the famous Kentucky colonel's 'coon.

Unfortunately there never was any truth in the statement made by one of our very early aviators to an inquiring old lady who wanted to know " how an airman gets down if his engine stops?" to the effect that there were even then (in 1910 or so) several aviators up in the sky starving because their engines had stopped and they could not get down. One always remembers the reply of Glenn Curtiss at Reims in 1909 to an inquiring journalist who asked him whether it was possible to get up to 1,000 feet. Curtiss' reply was simply " Getting up to 1,000 feet is like getting to the bottom of the sea. It's dead easy." And he left the rest to be imagined.

What Flaps Do.

Wing-flaps, which are in essence a simple device to vary the curvature or camber of wings, are not new. They have been used on Mr. Fairey's seaplanes and land machines for several years with remarkable success. With the flaps properly operated his machines get off land or water with an alacrity impossible with ordinary wings carrying similar loads with similar power and they alight with proportionate slowness. But the new De Havilland 50 is the first commercial machine to be fitted with flaps which vary the camber of the wings automatically according to the speed of the machine, giving a deep curvature and a big lift at low speeds when starting or alighting and a flattened curve at high speeds.

The standard type D.H.50 is a remarkable aeroplane in that with a Siddeley Puma engine it flies at a higher speed with four passengers and a pilot and luggage than did its progenitor the famous D.H.9 with two passengers and a pilot using the same engine. With the new wing-flaps it is just as fast, but it lands at something between 10 and 20 miles an hour slower. Also it glides slowly in a better attitude, with the tail well up, so that the pilot can see where to alight instead of having his view blanketed by the lower planes. And when the pilot finally depresses the tail in the act of landing the machine drops quite flat for a few feet, the flaps apparently acting then as air-brakes, and the machine practically stops dead in its tracks.

In starting the flaps evidently give a big additional lift, for the climbing path of the machines is at a much steeper angle to the ground than is that of the standard 50. Probably the rate of ascent is no quicker, but after covering a given distance over the ground the flap-winged machine would certainly be at a greater height than would the one with the standard wing. Which means that though the standard type would probably be as high off the ground in a given number of seconds it would have travelled further over the ground to get there. Which again means that the flap-winged machine could get out of a small ground over tall trees or buildings when the standard type could not: or alternatively that it could get off the ground and climb slowly in a spiral path keeping inside the precincts of the aerodrome till high enough to start out across bad country or across an area of crowded houses and yet be always in a position to land back in the aerodrome in case of engine failure.

An Opportunity for Argument.

Of course all these benefits are conferred equally well by flaps operated by hand as in the Fairey machines. Conse-

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quently there seems to be an opportunity for some very pretty arguments as to the virtues of automatic flaps versus hand-operated flaps. Captain De Havilland believes, and with apparently good reason, that automatic flaps relieve the pilot of the trouble or anxiety, as the case may be, of working yet another gadget in his overcrowded cockpit. And he asks whether there is any conceivable situation in which it would be advisable to hold the flaps down by gearing when the speed of the machine is such as would pull them up against the strength of spring which he has found by experiment to be most suitable.

Perhaps Mr. Fairey as the pioneer of wing-flaps, who still holds to hand control, may be tempted to give his views on the subject. A discussion can only be to the benefit of everybody—manufacturers, pilots and passengers alike. Personally one is a friendly neutral.

The automatic flap, so long as it works, does certainly prevent any possibility of a careless or confused pilot forgetting to pull down his flaps and either landing at enormous speed or stalling and diving through trying to land slowly with the flaps in their normal level position. On the other hand it may be that a steeper angle of climb can be got by holding the flaps hard down and climbing with full engine power when with automatic flaps the increasing speed of the machine would tend to flatten out the flaps and so flatten the climbing angle. And it might be that a longer glide to reach a desirable piece of land or water in case of engine failure might be got by locking the flaps in their uppermost position till the moment came for alighting.

One suggests in all humility that perhaps here, as in the engine argument, the solution is a compromise—like the solution of most of life's difficulties. Perhaps the actual operation of the flaps might be automatic, but a simple hand control might be devised to lock them down or up as might seem most desirable to the pilot under the immediate circumstances.

A Non-Stalling Machine.

A most important characteristic of the flap-winged D.H.50 is that it cannot stall and dive. When one saw it tested by Mr. Hubert Broad, who is certainly one of the best British pilots of to-day, which means one of the World's best, an attempt to stall it at apparently 110 miles per hour caused a gentle flat descent which turned into a slow forward glide within ten seconds, and the nose never seemed to drop at all.

Whether this is characteristic of all flap-winged machines when the flaps are down one does not know. It is at any rate a feature of the Fairey Flycatcher. In any case it ought to be made compulsory in all aeroplanes, but more especially in those intended to carry passengers.

Here then we have had during the past week demonstrations of two machines which have shown how much can be done to procure safety in Civil Aviation if those responsible for air line development will learn the obvious lessons from them. We have seen (or at any rate some of us have seen) a machine with three engines which is not very likely to be compelled to make a forced landing anywhere. And we have seen a machine which cannot stall and dive. And we have seen a machine which can be brought down slowly and planted flat on the ground.

How Long, O Lord?

These are three qualities for which one has been agitating in this paper till most of one's readers must have become fairly sick of reading about them. After all these years we have achieved these qualities—on different machines. And now one would like to know (A) How long it is going to be before someone combines the qualities in one machine? (B) How long it will be before they are combined in a machine which will be used regularly on an air line? And (C) How long it will be before the same qualities are embodied in a machine which does not seem to have been produced by an engineer who has graduated in the Forestry Department before metallurgy was discovered?

Probably the answers will be something like three, five and ten years respectively, unless the next war accelerates design and production a trifle. But the answer to all of them might be "Next Year" if only the Technical Department of the Air Ministry or the Board of Imperial Airways Ltd. would act promptly.

THE AIR LINE ARGUMENT.

The argument between the Directorate of Imperial Airways Ltd. and the pilots of the formerly existing air lines has progressed a trifle further during the past week. The fact that the Directors should have allowed fifteen or sixteen unemployed pilots to hold up all air-line work for three weeks strikes one as displaying amazing forbearance and a most praiseworthy desire to give the pilots fair play. Every effort was made to meet the wishes of the malcontents and one is glad to learn that after the whole issue had been narrowed down to a single point of personal antipathy some of the pilots had the good sense to accept the terms offered. The result has been that the London-Paris service began again on Friday last.

On Thursday, Apr. 24, Imperial Airways Ltd. issued the following statement:—

In view of the statements which have been appearing in the Press as to the dispute between the Civilian Air Pilots' Federation and the refusal of the pilots to enter the service of Imperial Airways, Limited, the Board of that Company consider it desirable that a statement of the case should be issued to the Press.

The Federation of Civilian Air Pilots, which is a recently registered Trade Union, with a membership, it is believed, of twenty-eight pilots, of whom sixteen were until Mar. 31 last in the employ of the Handley Page, Instone, and Daimler Air Lines. wrote upon Mar. 6, when the question of a Manager for Imperial Airways was under consideration, and recommended a certain gentleman as the only manager satisfactory to them.

The Board of Imperial Airways, after the most careful consideration and inquiry, and after considering the qualifications of all applicants for the post, including those of the gentleman recommended by the pilots, decided on Mar. 10 to appoint Major Woods Humphery, the manager of Daimler Airways, in which capacity he acted until Mar. 31. On Mar. 28 and 29 the Pilots' Federation wrote to the managing director of Imperial Airways, Limited, setting out the basis of remuneration and conditions of service upon which their members were prepared to accept employment with Imperial Airways, Limited, and no mention of the manager was made.

The Board of Imperial Airways, Limited, have settled the terms and conditions of employment of the pilots, and it is admitted by them that no material question is outstanding except the question of who is to be the manager of the Company

The terms of employment which have been settled and are no longer in dispute provide for—

An average of less than two hours' flying per day;

That a first year pilot would have, on an average, gross earnings of about £780, and a fifth year pilot £880, with flying insurance of £1,000;

An agreement for a year, and thereafter subject to three months' notice;

That the pilots of the three absorbed companies should be employed, although they were in excess of the number required for the immediate flying programme of Imperial Airways.

The only point now at issue between the pilots and the Board of Imperial Airways is as to the appointment of manager.

Before appointing Major Woods Humphery the Board took the fullest possible precautions to obtain a suitable manager of the highest qualifications, and finally decided on his appointment.

Decision Confirmed.

On Apr. 15, for the first time, the pilots submitted a written statement of their objections to Major Woods Humphery as a Manager, although at conferences with the Board they had previously made verbal allegations of a like character.

The Board have considered as exhaustively as possible the allegations, both written and verbal, which have been made, and yesterday reviewed the whole question and considered in detail and at great length the documental evidence and written testimonies put forward on the allegations of the pilots.

As a result, the Board came to the unanimous conclusion that they could see no justification for reversing their decision that Major Woods Humphery was a fit and proper person to be Manager of Imperial Airways, Limited.

They are fortified in this view by the fact that two out of the four pilots lately employed with the Daimler Airways, Limited, have disassociated themselves from the action of the Pilots' Federation and are prepared to fly under Major Woods Humphery. Whatever allegations may be made against Major Woods Humphery now, up to the time when he ceased to be Manager of Daimler Airways, Limited, on its absorption on Mar 31 last, the Daimler Airways, Limited, recall no complaint against him during his period of management with their undertaking and regard him very highly. The Board cannot admit the right of the pilots to dictate as to who should or should not be the manager.

It has been suggested in the Press that the Manager of Imperial Airways, Limited, was to be vested with powers which would force pilots to fly under conditions when their particular knowledge and experience would dictate to them that it was unsafe to do so, and the Board of Imperial Airways, placing safety in the forefront of their policy and desirous of allowing no room for misunderstanding on this point, have informed the pilots in writing that they are setting up, as part of their permanent organisation, a committee consisting of the chief pilot of the company and four pilots elected amongst themselves, and that that committee "shall be the authority under the Board for deciding all matters in which the pilots' special knowledge and experience are essential, and that the pilots' point of view can be fully represented by the chief pilots' attendance at the regular meetings of the Board, as he would report to the Board on all these matters."

In addition the Board, at their meeting yesterday, adopted the following rules:

No pilot to fly more hours per week than those agreed from time to time in writing between the Chief Pilot and the Management.

No pilot to be allowed to fly if he considers the weather unsafe, in which case he will notify the Chief Pilot or official in charge in writing.

No pilot to be allowed to fly a machine which he considers in any way unsafe, in which case he will notify the Chief Pilot in writing.

No pilot to be allowed to fly a machine on service unless he has inspected its air-worthy certificate for the day

With these provisions, the Board feel they have fully met the claims

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> of the pilots to be the authority on matters where safety depends upon their special knowledge and experience.
>
> The Board have so far taken no steps in the appointment of other available fully experienced and licensed pilots, which might make a settlement more difficult, but their obligations make it incumbent on them not to hold up civil flying any longer, and they have informed the Pilots' Federation accordingly.

Should Employees Select Their Employers?

One cannot help feeling that the Directors of Imperial Airways Ltd. have gone even too far out of their way to meet the pilots. When one considers that the skipper of a trans-Atlantic liner with twenty or thirty years' experience behind him is lucky to get £1,000 per annum, and when one compares his responsibility with that of an air-line pilot carrying half-a-dozen or a dozen people it seems ridiculous to pay an aviator £800 a year or more. What sort of wages will these young men expect after another five or ten years when they have become, presumably, really valuable servants of the company?

Nobody can blame the pilots for taking all they can get, but one believes that it was an error, due doubtless to sheer kindness of heart, which prompted the Board to start them on such immense pay for such short working hours. It is subversive of all business principles to allow would-be employees in a new form of business to dictate their own wages before the business has shown whether it can pay its way or not. Also one is convinced that no possible method of transport can stand a wage-bill of £1 per hour for drivers, which is what two hours' work a day at £730 means, especially when each driver only carries at most 10 passengers on the average. and with the more highly paid pilots this will amount to 25s. per hour.

Furthermore it was, one feels, a similar error to treat with the pilots in their corporate capacity. A Trade Union of twenty-four members is an absurdity. And it is sheer impertinence on the part of these young men to claim to choose who should be manager. There are dozens of good pilots more or less recently demobilised from the Royal Air Force who would be glad of jobs at anything from £500 upwards. Apart from the general principle that there are better fish in the sea than ever came out of it, there is always the argument that a pilot freshly out of the R.A.F. has probably more up-to-date knowledge of various machines and engines and gadgets than has a pilot who has been flying one type of machine over one air line for a year or so. And one is sure that the R.A.F. pilot would have more recent experiences of sudden emergencies and of forced landings in unpleasant places.

The one really comic note in the whole dispute (the rest of it being simply pathetic or merely irritating) is the pilots' demand for a Court of Inquiry. One could imagine nothing which would better please Imperial Airways Ltd. But one does hope most sincerely that if such Court of Inquiry should be constituted by the competent Government authority one of its first terms of reference will be into the source and origin of the dispute. If that can be traced and if some of the leaders of the agitation can be examined and cross-examined on oath the result should be surprising to some people and intensely amusing to the multitude.

The following notes on this phase of the subject appeared in *The Morning Post* on Apr. 26 :—

> Reviewing the position yesterday, Captain Hinchcliffe, a member of the Committee of the Federation of Civil Air Pilots, said: "We have repeatedly requested the Board of Imperial Airways to have a Court of Inquiry, and they have constantly refused. We promised that if the Court found that our contentions with regard to the manager were groundless we would go back at once. We are still absolutely unanimous, both the men and the pilots, on this question of principle."
>
> The strikers, it is added, are willing to abide by any decision a Court of Inquiry may arrive at, and "will go back to work as soon as the Inquiry is opened."
>
> "It has taken the Federation twenty-four days to obtain so-called concessions from the Imperial Airways, Limited," said Captain Barnard, of the Pilots' Federation. "We do not intend to fly until the whole programme for the safety of the public is obtained. The major points for which we are standing out have not yet been conceded. The statement that British aviation is going to start all over again as an attenuated freight service is too pitiful for serious consideration.
>
> "The whole matter will be raised in a very acute form when Parliament meets next week. The mechanics, in addition to the pilots, are standing out for the principle of safety, even though it is involving very considerable sacrifices on their part."

To these remarks there is only one possible reply and that is the expressive if inelegant American phrase :—"Pure bunk." The truth (in part) is that for twenty-four days several misguided young men have helped a few clever schemers to hold up a very sound organisation which will yet do much good to British Civil Aviation.

In the meantime these self-esteemed young men who demand pay far superior to that of any ordinary master-mariner have convinced a good many people that flying is a horribly dangerous occupation which is only "fit for heroes to live in" and that to be a passenger and partake of their perils one must also be a hero. And as most people have ceased to be heroes since the War 1914-18 there is likely to be some diminution in the passenger receipts, and a consequent reduction in mileage pence for the pilots' pockets. As examples of birds fouling their own nests the pilots have done well, and this is about the only thing in which they have displayed ability.

Fortunately, in spite of all their fuss, the Great British Public remains cold about civil aviation. The average man merely remarks that he sees in the papers that "those silly boys at Croydon" are still refusing to work. But he is not interested, because he does not contemplate travelling by air. So, like most pioneers and martyrs, the said silly boys have done more harm to themselves than to anybody else.

Perhaps in a few weeks' time when the air lines start work again under efficient management and are properly advertised to the Public the average man will take a trip by air. By that time he will have forgotten all about the heroes and their strike. And when he gets out of the machine after a safe journey he will perhaps regret that the driver is so high up in the nose that he cannot offer him a tip. He will not even know that the pilot is probably being paid about twice what he is able to earn himself by solid toil with much greater responsibility.—C. G. G.

THE GLOBE TROTTERS.

The British Team.

Everybody will feel the deepest sympathy for Sq. Ldr. MacLaren and Flg. Off. Plenderleith in the second misfortune which has befallen them by being brought down in the Sind Desert.

As reported in The Aeroplane last week the expedition left Baghdad on Apr. 21 for Basra and landed at Shaiba, where is the Basra Aerodrome. Here they stayed nearly three hours for lunch while a small repair was made to the hull. Leaving at 15.33 hrs. they reached the Persian coast at 17.20. Thereafter they met a very strong head wind and at 18.30 alighted on the sea where they taxied shoreward and tied up to a native boat for the night.

At 05.30 on Apr. 22 they got off the water and landed at Bushire Aerodrome at 05.45. Leaving there at 11.14 (local time) they alighted in the sea off Bandar Abbas at 15.46 where they let down their wheels and taxied onto the beach.

At 08.25 on Apr. 23 they left the beach at Bandar Abbas and landed at Charbar aerodrome at 11.35. They left there at 14.35 and landed at the Karachi Aerodrome (Drigh Road) at 18.02. Here the R.A.F. under Wing-Commander Hicks, O.C. Aircraft Depot, overhauled the engine and tuned it up generally. The new Napier Lion engine had worked perfectly all the way from Corfu and had been run at 1,800 r.p.m. for the greater part of the journey though its maximum was 2,200 r.p.m.

On Apr. 26 the expedition left Karachi at 07.09 hrs. hoping to arrive at Nasirabad at about 14.00 hrs. It was not until the next day that it was learned that they had been brought down about thirty miles from West Luni Junction with a broken reduction gear and crankcase.

The Times reports that spare engines of the required type are not obtainable in India. It is hardly likely that it would be advisable to rebuild the engine in the Sind Desert from spare parts, and therefore seems probable that a complete new engine will be sent to India from Iraq where Lions are used in some of the big Vickers troop carriers. In the meantime R.A.F. mechanics and a portable shed have been sent to Partu where the machine is lying.

Sq. Ldr. MacLaren and his crew deserve every credit for the splendid flight they have made, and the use of an amphibian for this journey has been thoroughly justified. At the very start a land machine would probably have come to an untimely end through flying into the fog at Le Havre. Later when the forced landing was made at Corfu a land machine would probably have been smashed in landing even though the crew might not have been hurt. Still further along the route the Vickers Vulture landed in the Desert and demonstrated that she had the qualities of a good land machine.

Going down the Persian Gulf she demonstrated the benefits of having the choice of alighting on land or water according to whichever seemed more suitable at the moment, for when overtaken by darkness Mr. Plenderleith brought her down on the water, the crew sleeping on board for the night. And next day he chose to alight in the water and taxi ashore rather than risk using the bumpy aerodrome at Bandar Abbas. The fact that the machine when ultimately compelled to alight in the Sind Desert did so without incurring damage is further proof of the benefits of the amphibian.

All will hope that the erring engine may be replaced with all speed from Iraq and that good luck may attend the rest of the journey.

The French High-Speed Journey.

Quite the most remarkable flight of all the globe-trotting expeditions has been made during the past week by a French

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England to Constantinople	2,160 miles
England to Finland	1,100 miles
England to Warsaw	1,050 miles
England to Madrid	855 miles

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pilot, Lieutenant Peltier d'Oisy, who had already won fame by making a flight from Tunis to Paris without alighting.

Flying a standard Breguet of the 19A2 type with a Lorraine-de Diétrich engine of 370 h.p., and accompanied by his mechanic Bernard Vésin, M. Peltier d'Oisy left Villacoublay near Paris at 06.15 hrs. on Apr. 24, passed over Budapest at 13.10 hrs. and landed at Bukarest at 17.00 hrs., having accomplished the whole flight of 18,040 kilometres (1,240 miles) in 10 hours 45 minutes without a landing.

This is the longest non-stop flight yet made in a straight line overland, and so it will be the first record to be passed by Fédération Aéronautique Internationale in the new category for flights of this nature.

On Apr. 25 he left Bukarest at 09.00 hrs. and landed at Aleppo at 17.00 hrs. having covered the distance of 930 miles in eight hours. He passed over Adrianople, Constantinople and Konia. In his telegraphic report to the Service d'Aviation Militaire he stated that he crossed the Taurus Mountains at 11,000 feet.

A dispatch from Baghdad reported that M. Peltier d'Oisy had arrived at Baghdad on Saturday afternoon, Apr. 26. Thus he had covered the whole distance from Paris to Baghdad in 2½ days. M. Peltier d'Oisy's ultimate objective is Tokyo but if all goes well he may continue to Canada. After which it seems likely that he might be tempted to continue to Paris.

Apart from his Tunis-Paris non-stop flight he has the qualification of having been before the War a well-known Rugby player. Rugby enthusiasts will doubtless remark that his recent performance was a very fine try.

M. Peltier d'Oisy left Bushire at 05.30 on Apr. 28 and arrived at Bandar Abbas (340 miles) at 08.00 hrs.

The Times correspondent in Paris writing on Apr. 28 says :—

> The Department of Military Aeronautics issued a Note this evening in which it was stated that Lieutenant Peltier d'Oisy made a landing at Bushire, according to instructions, in order to convey a message to the small French Air Mission in Persia which is at present stationed there. The mission, which consists of one pilot and three mechanics, has been in Persia since Feb. 21, and is to start an aviation school at Teheran.

The American Expedition.

The U.S. Army Expedition has been held up for over a week owing to Major Martin's forced landing in Portage Bay. The other three machines reached Dutch Harbour (Attu Island) and they have been waiting for Major Martin, the officer commanding the Expedition, whose machine has been fitted with a new engine at Kanatak Head.

On Apr. 26 these repairs were completed and Major Martin left for Chignik where he arrived the same day, whence he still has to reach Dutch Harbour.

Violent blizzards with a temperature of 20 degrees below zero are being experienced in the Aleutian Islands and the extreme North Pacific.

The Flight round Australia.

Wing Commander Goble and Flg. Off. MacIntyre, R.A.A.F., who are flying round Australia on a Fairey IIID seaplane (360 h.p. Rolls-Royce engine) have reached Port Darwin.

They left Melbourne on Apr. 6 and reached Sydney (450 miles) in 10 hrs. 20 mins.' flying. On Apr. 13 they reached Townsville. On Apr. 16 after a stop at Cooktown, Queensland, they reached Thursday Island, the most northerly point of Australia. On Apr. 23 Elcho Island was reached after a flight across the Gulf of Carpentaria and the following day they arrived at Darwin after a four hours' flight from Elcho Island.

The 700-mile flight to Darwin from Thursday Island was made under very unfavourable weather conditions. The seaplane flew through rain and sleet and bitterly cold atmosphere the crew suffering from the intense cold in spite of flying through a so-called tropical area. Valuable information has been collected regarding the uninhabited regions over which they have so far flown. They have now covered 3,165 out of the total 9,000 miles round Australia.

One daily paper in recording the flight stated that the Fairey IIID used on this expedition was presented to Australia by the British Government. This is not so, the machine used being one of a batch of six Fairey IIID seaplanes bought from the Fairey Aviation Co. Ltd. some two years ago.

On Apr. 28 the Fairey IIID reached Broome, West Australia, after a 700-mile flight from Darwin in two stages. The expedition has now covered over half the total distance round Australia.

The Lisbon-Macao Flight.

Capt. Brito Paia and Lieut. Sarmento Beires, of the Portuguese Army Air Service, who are attempting to fly from Lisbon to Macao, at the mouth of the Canton River, China, on a Breguet biplane (300 h.p. Renault engine) reached Damascus on Apr. 24.

Much enthusiasm prevails in Lisbon and a national subscription has been opened to cover the expenses of the flight.

Fine Flying in Chile.

A particularly noteworthy flight has recently been completed by a formation of five D.H.9s (Siddeley Puma engines) belonging to the Chilean Army. The machines are a portion of those fifty aeroplanes presented in 1918 to the Chilean Government by the British Government as compensation for commandeering on the outbreak of war in 1914 a cruiser which was building for the Chilean Navy in a British shipyard. This ship was later known as the Canada and is now in the Chilean Navy as the Latorre. These aeroplanes were delivered in 1918 and spent two years in their cases in Chile under a tropical sun before being assembled and made airworthy by that British Aviation Mission which visited Chile under Major F. P. Scott which also trained all the aeroplane pilots of the Chilean Army.

This recent flight was from Santiago to Tacna and back, a distance of some 4,000 kilometres (3,000 miles in all). Tacna is an area which is constantly in dispute between Chile and Peru, and an American Mission is now there conducting a plebiscite as to whether the area in future shall belong to Chile or Peru. The flight was in fact the first flight from the capital of Chile to the Peruvian frontier.

As an indication of the gratitude which the Chileans have shown throughout their history for those who confer benefits on them it is of interest to quote the following telegram which was sent to the Editor of the *Mercurio*, the leading Chilean newspaper, who has always been a warm friend of the Air Force :—

> Having completed the first long stage of the instructional cross-country flight, thanks to the merit of British machines and to the skill of the pilots formed in the rigid school established by the well-remembered Major Scott, we send our regards and confirm our affectionate gratitude for the stimulating help you have always given the Flying Services.
>
> (Signed) General Contreras and pilot officers.

General Contreras is one of the most senior officers of the Chilean Army and is at present Inspector-General of Aviation. It is particularly praiseworthy that an officer of his age and seniority should engage in such a lengthy flight over country which hardly anywhere provides a landing ground, and it shows the confidence which the General feels in the force under his command. His confidence has been justified by the fact that the 4,000 kilometres was covered without an accident of any kind.

It is further of interest to learn that Capt. Aracenas, who was the hero of that very remarkable flight from Chile over the Andes across Argentina and up the Brazilian coast to Rio de Janeiro on the occasion of the centenary celebrations there last year, arrived in England on Apr. 28 accompanied by various officers of the Chilean Army with the idea of learning as much as possible about the theory and practice of the Royal Air Force.

The Chilean Navy has always based its organisation on that of the British Navy and it is to be hoped that the Air Ministry will so arrange the reception of these officers that the Chilean Government will be convinced that it should base its air organisation on that of the Royal Air Force.

The Prague Aero Show.

It has now been definitely settled that the Air Ministry will make a grant to the Society of British Aircraft Constructors to assist them in making an adequate exhibition of the products of the British Aircraft Industry at the Prague Aero Show, which is to be held this summer. There is no doubt whatever of the interest which is taken in Central Europe in the development of aerial transport, both military and civil, and it would have been extremely regrettable if the British industry had failed to be represented adequately on this occasion.

The following aircraft firms are exhibiting at the forthcoming International Aero Show to be held at Prague from May 31 to June 9 :—

Czecho-Slovakia :—" Aero " Aircraft factory (aircraft); M. Bondy and Co. (aircraft); Military Aircraft Works (aircraft); Skoda (engines); Walter (engines); Breitfeld and Danek (engines).

France :—Breguet (aircraft); Farman (aircraft); Blériot (aircraft); Lioré et Olivier (aircraft); Henry Potez (aircraft); Dewoitine (aircraft); Gourdou-Leseurre (aircraft); Salmson (aircraft and engines); Loraine-de-Diétrich (engines).

Germany :—Junkers (aircraft); Albatros (aircraft); Dietrich-Gobiet (aircraft) and Dornier (aircraft).

In addition to the above firms who are showing collectively about 40 aircraft, stands have been taken by the Ministries of National Defence and Public Works of Czecho-Slovakia, the French Sous-secretariat de l'Aeronautique, the various Aero-clubs and societies, aeronautical journals, air lines, and aeronautical accessory manufacturers.

The Exhibition will be opened by the President of the Czecho-Slovak Republic on May 31 at 11.00 hours.

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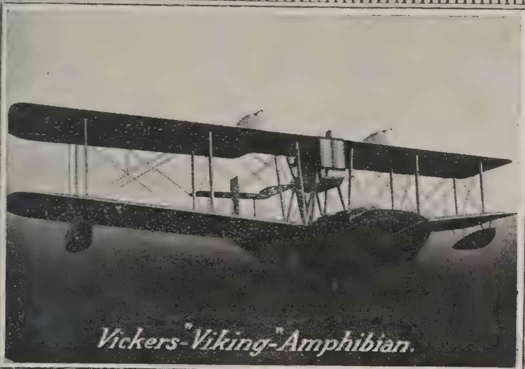

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THE ROYAL AIR FORCE.

Appointments.

Two weeks ending Apr. 28.

General Duties Branch.—Air Commodore F. C. Halahan, C.M.G., C.B.E., D.S.O., M.V.O., to Air Ministry, on appointment as Director of Technical Development, 18/4.

Group Captain C. F. Kilner, D.S.O., to H.Q., Coastal Area, for duty as Chief Staff Officer, 14/4.

Wing Commanders A. C. Winter, O.B.E., to R.A.F. Depot, on transfer to Home Estab., 2/4; A. Shekleton, D.S.O., to R.A.F. Depot, for charge of Central Trade Test Board, 7/5.

Squadron Leaders V. S. Brown, to Aircraft Depot, Egypt, 1/4; R. B. Maycock, O.B.E., to Marine Aircraft Exper. Estab., 1/5. J Leacroft, M.C., to No. 17 Sqdn., Hawkinge, 1/5.

Flight Lieutenants A. F. Somerset-Leeke, to Engine Repair Depot, Egypt, 26/3; F. G. Stammers, O.B.E., to H.Q., India, 11/4; H. W. Woollett, D.S.O., M.C., to H.Q., Egypt, 31/3; F. St. J. Woollard, A.F.C., to No. 216 Sqdn , Egypt, 31/3; A. R. M. Rickards, A.F.C., to No. 2 Arm. Car Coy., Palestine, 31/3; F. H. E. Reeve, to H.Q., Palestine, 31/3; H. L. Nunn, D.S.C., D.F.C., to H.Q., Coastal Area, 1/5; D. H. Dabbs, to No. 32 Sqdn., Kenley, 23/4; F. St. J. Woollard, A.F.C., to H.Q., Egypt, instead of to No. 216 Sqdn., 31/3; F. H. E. Reeve, to remain at No. 216 Sqdn , Egypt; H. T. Lydford, A.F.C., to No. 4 F.T.S., Egypt, 1/4

Flying Officers R. R. Greenlaw, to No. 47 Sqdn , Egypt, 7/4; G. V. Carey to No. 2 Sqdn., Manston, 1/5; G. C. B. Bernard-Smith, to R.A.F. Depot (Non-effective Pool); T. A. Verney-Cave, to School of Army Co-operation, Old Sarum, 19/5; K. L Boswell and E. A. Healy, to Aircraft Depot, India, 11/4; J P. Huffam, V.C., and H. P. F. Fagan, to No. 55 Sqdn., Iraq, 5/3; H. J. M. Berthon, to R.A.F. Base, Leuchars, 1/5; H .R. B. Howell, G. McClintock, L. W. H. Phillips and F. P. Smythies, to No. 2 F.T.S., Duxford, 1/5; E. T. O'N. Hogben, J. R. Bowring, M.C., S. P. George, J. B. Knocker and H. V. Smith, D.C.M., to School of Army Co-operation, Old Sarum, 1/5; W. J. Brown, to R.A.F. Base, Calshot, 15/4; H A. Castaldini to No. 1 S.D., Kidbrooke, 23/4; R. Y. Eccles, to R.A.F. Depot, on appointment to a S.S. Commn., 15/4; C. Ayling, to remain at R.A.F. Depot; C. Wilson, to R.A.F. Depot, on appointment to a S.S. Commn., 14/4; F. G. A. Robinson, to No. 4 Sqdn., S. Farnborough, 1/5; H. C. Bobbett, to Air Ministry, 23/4; H. Stafford, to Arm. and Gunnery School, Eastchurch, 1/5.

Pilot Officers F. Boston, D T. H. Hooke and A. S. Lewis, to School of Army Co-operation, Old Sarum, 1/5; L. M. T. Marescaux, to No. 7 Sqdn., Bircham Newton, 1/5; H. I. Cozens, R. T. Taaffe and N. J. Wiltshire, to No. 2 F.T.S., Duxford, 1/5; J. R. Pocock, to R.A.F Base, Gosport, 1/5; D. R. Stewart, to No. 84 Sqdn., Iraq, 5/3; R. H. Carter, to R.A.F. Base, Leuchars, 17/4; W. D. Baxter, and H. V. Kerchove, M.C., to R.A.F. Base, Leuchars, 1/5; E. G. Whinney, to No. 19 Sqdn., Duxford, 1/5

Medical Branch.—Flight Lieutenants (Medical) W. E. Hodgins, M.B., to No. 31 Sqdn., India, 13/3; J. D. Leahy, M.C., M.B., B.A., to No. 5 Sqdn., India, 13/3; F. T. Boucher, to Research Laboratory and M.O. S of I., Hampstead, for short course on appointment to a S.S. Commn., 2/4; R. L. C. Fisher, M.B., to Research Laboratory and M.O. S of I., Hampstead, for short course on appointment to a S.S. Commn., 7/4; F T. Boucher, to School of Naval Co-operation, Lee-on-Solent, 22/4; T P. Harpur, to R.A.F. Depot, 15/4; A. V. Comber, to I.A.A.D., Henlow, 15/4; E. G. Howell, to Aircraft Depot, Egypt, 31/3. Flying Officer (Medical) F. W. G Smith, M.B., B.A., to Marine Aircraft Exper. Estab., Felixstowe, 12/4.

The London Gazette.

Apr. 22.

General Duties Branch.—The folg. are granted perm. commns. as Flt. Lts. (Apr. 23) :—H. W. Baggs, W. M. Fry, M.C.

The follg. are granted S.S. commns. as Flg. Offs. with effect from, and with seny. of, the dates indicated :—C. Wilson (Apr. 14); R. Y. Eccles (Apr. 15).

Plt. Off. on probation T. W G. Cattell is confirmed in rank (Apr. 10); Flt. Lt. T. S. James is transferred from the Stores Branch to the General Duties Branch, retaining his present rank and seny. (Apr. 11); Sq. Ldr. R. Addenbrooke-Prout resigns his perm. commn. (Apr. 23).

Stores Branch.—Pt. Off. on probation J. Charles is confirmed in rank and is promoted to the rank of Flg. Off. (Dec. 5, 1923).

Medical Branch.—R. L. C. Fisher, M.B., is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, Apr. 7.

Princess Mary's Royal Air Force Nursing Service.—Staff Nurse Miss M. Simpson relinquishes the acting rank of Sister (Jan. 29).

The Fleet Air Arm.

An Admiralty Order issued on Apr. 25 deals with the new scheme for the Fleet Air Arm. As the Admiralty has no official department of information and deals with the Press through serving officers of the Royal Navy it has not been possible to procure a copy of the document. *The Morning Post* and *The Times* report the Order as follows :—

Volunteers are required for the Naval Air Work of the Fleet, under the arrangements approved by His Majesty's Government, by which, to the extent of 70 per cent., the officer personnel of the Royal Air Force employed in the Fleet Air Arm may be provided from Naval Officers attached temporarily to the Royal Air Force for specified periods.

Officers volunteering must be of the rank or relative rank of Sub-Lieutenant or Lieutenant, and must be not above the age of 28 on July 1, 1924. In the main Officers selected will be of the Executive Branch, but a small number of (E) Officers and Officers, Royal Marines, are also required. Officers before selection will be required to pass a medical examination.

Officers who apply are required to volunteer for service in the Fleet Air Arm, involving attachment to the Royal Air Force for certain periods, the duration of which will be decided by the Admiralty from time to time. Officers who volunteer will not be required to undertake a second or subsequent period of attachment, except with the consent of the Officer concerned. For the present, it is intended that the periods of attachment and General Naval Service shall be approximately as follows :

A.—1st Period : Air—Four years, which will include a period of training.

B.—2nd Period : General Naval Service—Two years.

C.—3rd Period : Air—Two years for 50 per cent. of the officers who have completed A—the rest remain in the General Naval Service.

D.—4th Period : Air—Two years for 60 per cent. of the officers who have completed C—the rest remain in the General Naval Service.

E.—5th Period : General Naval Service, or Air, as required—For remainder, if any, of Lieutenant-Commander's time, for all officers who have completed D.

Appointments of attached officers will be made by the Air Ministry on the nomination of the Admiralty.

Naval or Marine Officers attached to the Royal Air Force will be granted Air Force rank during attachment, the initial rank granted being that of Flying Officer, and will be eligible for advancement in the Royal Air Force, irrespective of their rank in the Royal Navy. They will continue to wear the uniform of their Naval or Marine rank, but will wear also a distinguishing badge indicating that they are attached to the Royal Air Force for service in the Fleet Air Arm. They will draw their naval full pay, with an allowance of 6s. a day, paid under the general conditions laid down for submarine allowance.

This allowance may be drawn in addition to Naval specialist allowances for Gunnery, Torpedo, Engineering, or other similar duties.

During the periods of naval general service, however, when the officers cease to be attached to the R.A.F., the allowance for flying duties will not be payable.

When embarked during periods of attachment, their flying duties will be considered as equivalent to specialist duties. They will therefore have the rank and status and authority of their Air Force rank when they are engaged in specialist air duties; at other times, when they are engaged in General Naval duties, they will have their Naval or R.M. rank, status, and authority. They will be available for ship duty in addition to flying duty, and in order to emphasise this, they will, when appointed to a carrier or other of H.M. ships, receive an appointment from the Admiralty as well as an appointment from the Air Ministry.

Attached officers will be eligible for advancement in the Royal Air Force under R.A.F. Regulations, irrespective of rank in the Royal Navy or Royal Marines, and such advancement will be determined by the Air Ministry, in consultation with the Admiralty.

The promotion in the Royal Navy or Royal Marines of R.N. and R.M. officers serving in the Fleet Air Arm will be governed by Naval or Marine Regulations, and this service will be considered to be as good service towards promotion as if they had served in any other specialist branches. Naval and Marine officers who have had six or eight years' air experience will be favourably considered for employment in the higher posts in the Fleet Air Arm, both ashore and afloat.

Consequently, an appreciable proportion of such officers who receive promotion to commander and above in the Royal Navy or equivalent rank in the Royal Marines will be required for attachment to the Royal Air Force in higher ranks.

In addition, there can be little doubt that, with the continued development of Naval air work, air questions must enter more and more largely into Naval staff work, and a knowledge of such questions, obtained by actual experience of air duties, must become a very valuable asset for a War Staff officer, even if it does not become a necessity.

Special attention may be directed to the fact that officers will not, during any part of their periods of attachment, lose their association with the Royal Navy. They will continue to wear naval or marine uniform, and except for the initial training period, will normally be employed on Fleet air work. No naval or marine officer attached to the R.A.F. is to be appointed to a non-naval unit without the express consent of the Admiralty, given only in exceptional cases, and then only if the officer is himself willing.

When embarked in aircraft-carriers they will be able to keep up their knowledge of Naval duties by being employed on those as well as on Naval air duties.

Confidential reports will be signed by the Captain of the ship and forwarded both to the Admiralty and Air Ministry.

The first course is intended to start at No. 1 Flying Training School, Netheravon, Wilts, on May 15 next. Fifty-four officers can be taken for this and each of the subsequent courses. Volunteers are directed to forward their applications through the usual channels.

NAVAL AIR OBSERVERS.

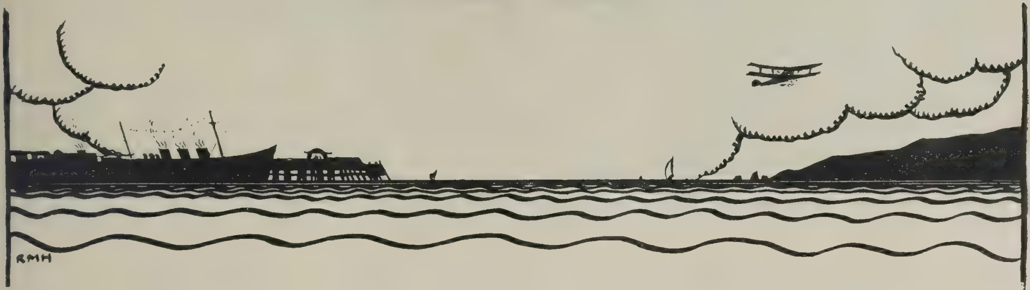
An order issued by the Admiralty in conjunction with that calling for volunteers for Naval Air Work with the Fleet announces :—

It has been decided that, in future, all air observation duties for the Fleet, including gunnery, spotting, and air reconnaissance, is to be carried out by Naval Observers.

Naval Observer Officers will not be "attached" to the Royal Air Force, as in the case of the Naval Officers to be employed as pilots and on other Naval air work, and their pay and conditions of service will continue on the same lines as at present, with the exception that, whereas Naval Observers have hitherto been employed on air "spotting" duties only and air reconnaissance duties have been performed by R.A.F. officers, in future there will be only one type of observer, who will be a Naval Officer trained in both gunnery, spotting, and air reconnaissance work, either of which duties he will be qualified to perform and may be called upon to carry out as he may be directed.

These new arrangements will probably necessitate some slight modification, and possibly extension, of the Observers' Course held at Portsmouth. The question of what further training, if any, will be required to be given to the existing naval observers in order to qualify them fully for the combined duties referred to is under consideration

TRAVEL



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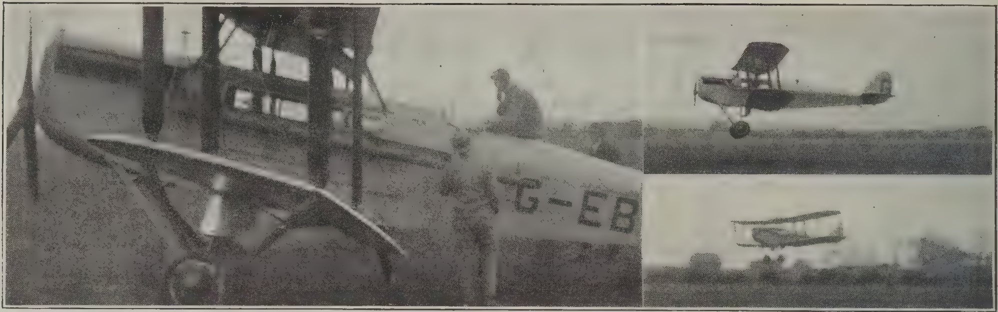
THE DE HAVILLAND AUTOMATIC FLAP GEAR.



SLOW LANDINGS.—The De Havilland 50 (Siddeley Puma) with automatic wing-flaps. On the right are seen the attitudes of the machine when starting and landing. On the left the flaps are shown in their depressed position.

The De Havilland Aircraft Company have for some time been experimenting with a new form of trailing-edge flap-gear as a method of increasing the speed range of aeroplanes, particularly by reducing the landing speed. Trailing—edge flaps have long been used for the purpose with considerable success, but the De H. flap-gear differs from other types, in that there is no additional operating gear involved and the flaps are entirely automatic in their action.

The flaps in this case, as in others, are exactly like normal ailerons, except that they extend over the whole span of the wings. When the machine is at rest the flaps are held down at an angle of approximately 15 degrees to the normal position corresponding to high speed flight by a stiff spring. The flaps remain in that position until the air speed of the machine rises to a moderately high figure, and as the speed continues to increase they quite gradually move up until they come against a stop in the high speed position.

The mean wing loading of any aeroplane is practically constant during any one flight, but as is well known, the distribution of pressure over the wing varies with the angle of incidence. As the angle of incidence is reduced—and the speed increases—the Centre of Pressure moves back. Consequently the load carried by a trailing edge flap of this sort increases as the speed increases, and it is this change in pressure distribution which operates the D.H. flap-gear.

All that the pilot has to do is to use his elevators to control his airspeed and subject to correct adjustment of the spring controlling the flaps these latter move downwards for low speeds and upwards for high speed.

This form of gear has been fitted to a D.H.50 machine for tests and has been found to perform most satisfactorily. Up to an airspeed of about 70 m.p.h. the flaps remain down at their limit position. At that speed they begin to move up and at 80 m.p.h. or thereabouts they are in a position corresponding to the normal wing section of the D.H.50.

The effect on the behaviour of the machine is very noticeable. The landing speed is reduced by about 6 m.p.h. to 42 m.p.h., and the lowest speed at which the machine is in comfortable control is reduced still more to about 50 m.p.h. instead of about 60 m.p.h. Another very noticeable effect is that the attitude of the fuselage of the machine changes very little indeed over the whole speed range, in fact, a passenger can scarcely tell whether the airspeed is 50 m.p.h. or 95 m.p.h. without looking at the air-speed indicator.

In a normal machine one is acutely conscious of the fact that the machine is tail down at low speeds, but as the pulling down of the flaps not only increases the camber, but also increases the angle of incidence, the angle of the body does not change by anything like so much as does the wing incidence.

The reduction in the speed of comfortable control is of very great value, for it allows the pilot to approach the landing ground at a low speed, and avoids the "kiteing" effect which is so marked in many modern machines where the pilot dare not drop his speed to anything like his ultimate landing speed until within a foot or two of the ground. As has been said, the comfortable low speed of the flapped D.H.50 is 50 m.p.h. At this speed the machine is not tail down, the pilot can consequently see what he is doing and the machine can safely be brought into the aerodrome at that speed with the result that it can be put into and pulled up in a remarkably small space—very much less than the mere reduction in landing speed would suggest.

Another effect which is of the first importance for commercial machines is the effect on the climbing gradient of the machine. The flaps probably do not make any noticeable difference in the rate of climb in feet per minute, but with them the pilot can climb safely at a considerably reduced forward speed. This of course increases the angle of climb appreciably. Add to this that the machine requires an appreciably reduced run to attain the reduced flying speed and the effect on the machine's ability to clear obstacles is very marked.

The automatic nature of the flap control appears to have important practical advantages. The pilot has no extra operations to concern himself with, he cannot forget his flap-gear, nor can he misuse it. Furthermore the absence of control gear undoubtedly makes for the saving of weight.

The only criticism which occurs relates to the dependence of the gear on springs and fear of what may happen if a spring breaks. But since the gear on the two sides is positively coupled by wires, and—in a biplane—top and bottom flaps can be rigidly connected, the breakage of one spring reduces the down pull on the flaps by only 25 per cent. The effect will be that the flaps go to the up position at a lower air speed. If all the springs break simultaneously while the machine is flying at a low speed—with the flap down—there may be risk of wrecking the flaps, for these will go up with a jerk. But it seems very unlikely that enough springs will break simultaneously to produce this effect, and provided that they fail by steps, the worst that can happen is that the pilot will have to fly with flaps permanently up, which only makes it a normal machine of its type.

SAFETY FIRST.—The three-engined Handley Page with a Rolls-Royce Eagle IX and two Siddeley Pumas.

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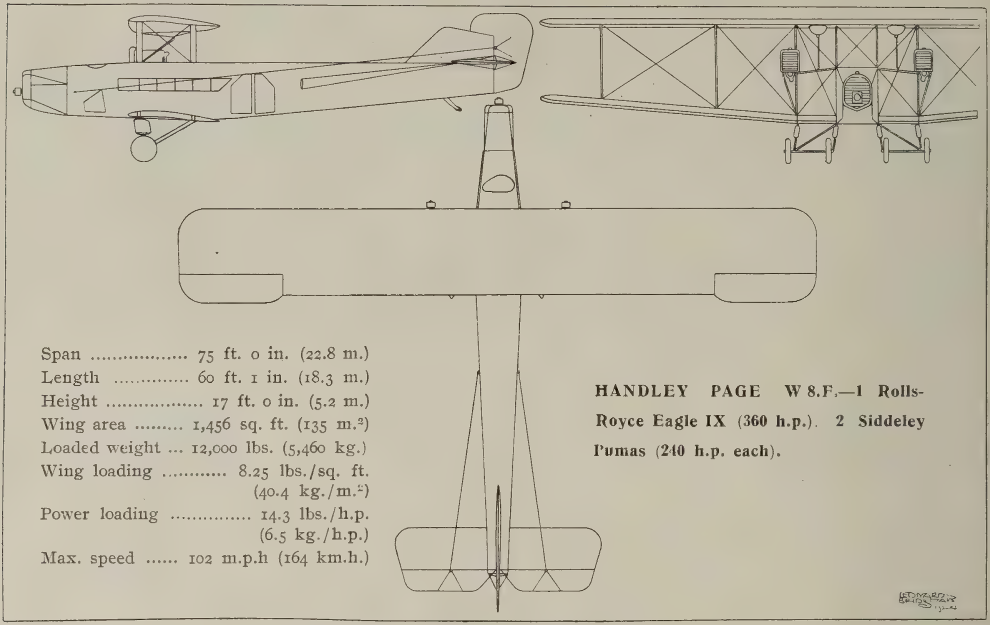
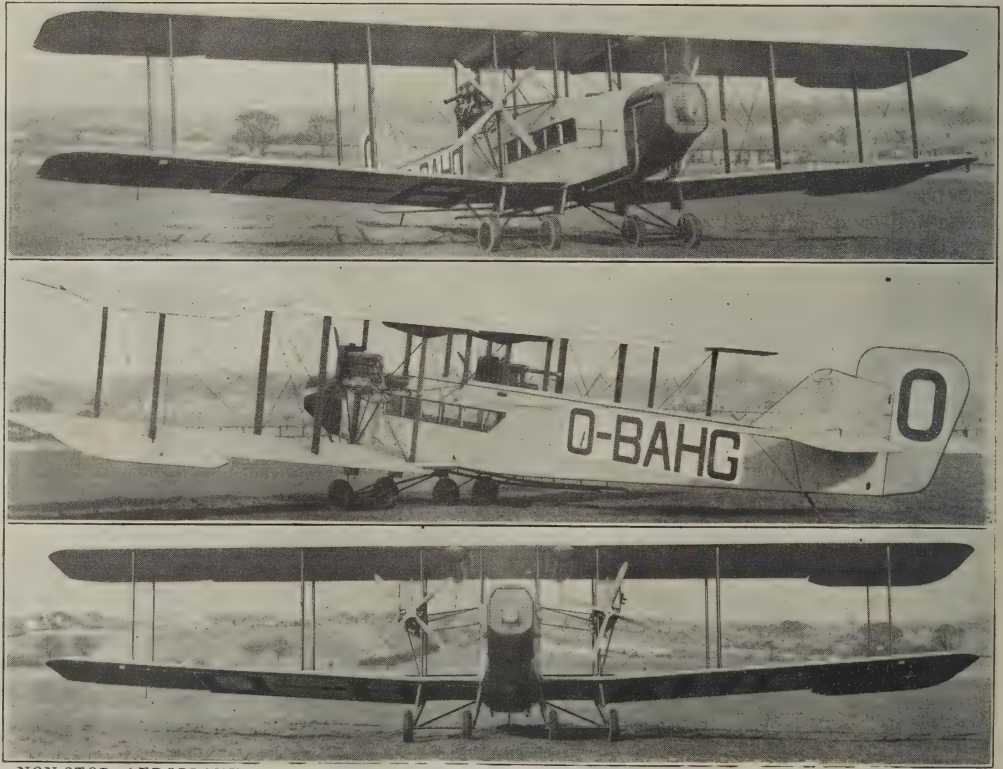
THE HANDLEY PAGE W8.F



Span	75 ft. 0 in. (22.8 m.)
Length	60 ft. 1 in. (18.3 m.)
Height	17 ft. 0 in. (5.2 m.)
Wing area	1,456 sq. ft. (135 m.^{2})
Loaded weight	12,000 lbs. (5,460 kg.)
Wing loading	8.25 lbs./sq. ft. (40.4 kg./m.^{2})
Power loading	14.3 lbs./h.p. (6.5 kg./h.p.)
Max. speed	102 m.p.h (164 km.h.)

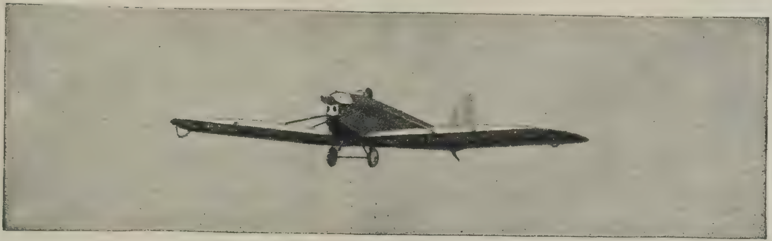
HANDLEY PAGE W 8.F.—1 Rolls-Royce Eagle IX (360 h.p.). 2 Siddeley Pumas (240 h.p. each).

The Handley Page W 8.F. is a modification of the now well-known W 8.B. type which has been designed specially with a view to producing a machine which shall be as nearly as it is possible to make it immune from involuntary landings caused by engine stoppage. The machine which is now being completed has been built for the Belgian S.A.B.C.A. firm, and will form a model which this firm will reproduce at its own works. These machines are intended for opera-



A NON-STOP AEROPLANE.—The three-engined Handley Page (Rolls-Royce Eagle IX and two Siddeley Pumas). It will be noticed that the nose is running.

ECONOMY



The D.H. Type 53

6 h.p. (696 cc.) BLACKBURNE TOM-TIT ENGINE.

As supplied to the British Air Ministry, the British Royal Air Force and the Commonwealth Government of Australia for training and practices at extremely low original, running and maintenance costs

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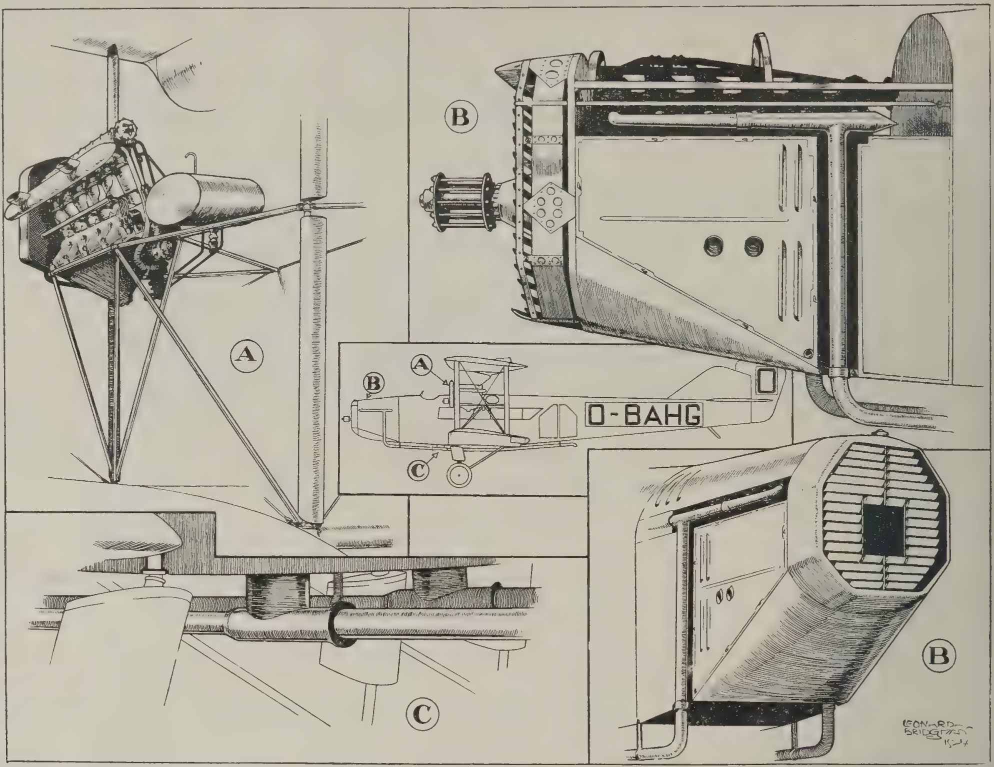

SOME DETAILS OF THE W 8.F.—(A) Port wing engine, mounting and oil tank. Note the canted engine. (B) The Rolls-Royce Eagle IX in the nose of fuselage. (C) Exhaust pipe muffs for warm air supply below cabin. The central sketch shows positions of the details.

tion in the Belgian Congo, and it will readily be understood that absolute freedom from involuntary landings is of the very first importance for service in such a country.

The standard W 8.B. with two Rolls-Royce Eagle engines and full commercial load can just about fly with one engine alone running. Thanks to this fact this type in normal use on the London-Paris service has always been able to reach a safe landing ground on the few occasions when one engine has ceased to function. But the machine has no reserve power under these conditions and could not be regarded as safe to fly for really long stretches over bad country—particularly in heavy weather.

The W 8.F. is of the three-engine type. It is fitted with one Rolls-Royce Eagle IX engine of 360 h.p. in the nose of the fuselage, and with two Siddeley Puma engines each of 240 h.p. on the wings in the positions occupied by the Rolls-Royce engines of the W 8.B.

With the Rolls-Royce Eagle alone in action the new machine should be in an appreciably better position than is the older two-engined type also with one Eagle engine alone —for with one engine on the W 8.B. the drag of the rudder which has to be carried to offset the turning moment of the engine is very considerable. In fact the W 8.F. ought to be quite comfortably flyable on the centre engine. With both Siddeley Pumas running and the central engine out of commission the machine has two-thirds of the full power of the W 8.B. available—that is, it should cruise comfortably under those conditions.

With one Puma and the Rolls engine it will have an extra 120 h.p. over that available with the two Pumas—which is considerably more than enough to offset the drag caused by rudder setting necessary to keep a straight course.

Thus the machine will not be forced to land by failure of less than two of its three engines, and even if both the Siddeley Pumas fail at the same time the central Rolls-Royce will suffice to keep the machine in the air for a very considerable time. Under the circumstances forced landing from engine failure should be a most improbable occurrence.

The machine itself is, except for the power plant, particularly a standard W 8.B. The wings, undercarriage, tail, and the greater part of the fuselage are actually identical with the same parts of the W 8.B. The nose of the fuselage ahead of the cabin has naturally been considerably modified. The pilot's seat is carried somewhat higher in the new type, and the top surface of the fuselage here is kept up to the full height of the cabin roof. The engine mounting, a triangulated steel tube structure, is built out from the end of the fuselage and isolated from the cockpit by the normal fireproof bulkhead.

Below the pilot's seat there is a luggage compartment as in the W 8.B., but owing to the increased height of the pilot's seat this compartment is of greater volume in the new machines.

In the W 8.B. the engine mountings were carried from a single pair of vertical interplane struts on each side—the engine bearer tubes being carried from a sort of bracket structure offset to the outer side of the interplane struts. The two Pumas on the wings of the W 8.F. are similarly carried on the outboard side of the inner pair of interplane struts. But whereas in the two-engined type the engines are entirely ahead of the front spar of the wings, in the new machine the wing engines are much further back in order to balance the added weight of the engine in the nose, and in the ordinary way the engines would have had to be offset from the vertical struts by a very considerable amount in order to clear the struts.

To keep the engines as close into the struts as possible, the engines have been tilted out of the vertical by some 15 degrees which gives them a somewhat curious appearance.

The radiators, however, are mounted ahead of the engines in a normal attitude, and a casual glance at the front of the machine would not indicate the curious attitude of the engines themselves. It is to be hoped that no nervous passengers catching sight of one engine from a cabin window after taking the air will conclude that the engine in question has begun to leave its place.

Honeycomb radiators fitted with normal type shutters are fitted ahead of each of the three engines. The central engine is fitted with long exhaust pipes which pass below the fuselage to right aft of the passenger cabin. Below the fore end of the cabin these pipes are surrounded by hot air muffs which supply warmed air to the cabin above. The delivery of hot air to the cabin is controlled by a valve in the cabin itself.

The starboard Puma engine, whose exhaust ports face the cabin, is also fitted with a long exhaust pipe. The other Puma, which exhausts away from the cabin, has a shorter

ESTABLISHED 1912.

SUPERMARINE ENGLAND

"CHANNEL TYPE" SCHOOL MACHINE.
240 h.p. Puma.

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360 h.p. Rolls-Royce.

"SEA EAGLE" 8-SEATER COMMERCIAL AMPHIBIAN.
360 h.p Rolls Royce Eagle IX.

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exhaust pipe. These arrangements, it is hoped, will secure relative peace in the cabin, but will doubtless be modified if experience proves that more complete silencing is necessary.

The petrol supply is carried in two tanks in the upper wing between the wing engine struts and the centre section struts, and all carburettors are gravity fed, the available head for the wing engines being at least 8 ft., while that for the centre engine is considerably more. Standard tanks carry 125 gallons each, but alternative tanks of 190 gallons each way may be fitted instead. An independent oil tank is carried behind each of the three engines.

The passenger cabin is precisely similar to that of the W 8.B., and is fitted provisionally to carry 10 passengers, on the assumption that a considerable quantity of mail and freight will also be carried. The cabin can, however, be fitted to carry up to 14 passengers if a reduced load of freight is carried. A lavatory is fitted to the after end of the cabin, and behind this and entered through a separate door is a large luggage compartment.

As has already been mentioned, the wings, undercarriage, and tail unit are identical with those of the standard W 8.B., and their form is adequately shown by the general arrangement drawing reproduced.

The Busk Studentship in Aeronautics.

Edward T. Busk, who was responsible for a great deal of extremely valuable experimental work at the R.A.F. at Farnborough before the war, was killed at that establishment in 1914 as the result of an aeroplane accident.

In memory of his work a "Busk" studentship in aeronautics of the annual value of approximately £150 has been established, and the trustees announce that they hope to make the first appointment towards the beginning of July.

The studentship is open to any man or woman being a British subject who had not attained the age of 25 years on October 1st last, and the object thereof is to enable the holder to engage in research, or in preparation for research, in aeronautics specially in such subjects as the problems of stability, or of meteorological questions bearing on flight which were of special interest to the late Edward Busk.

The studentship is tenable for one year from October 1st with the possibility of the student being reappointed for a second year. The student will be expected to devote his whole time to research on a subject approved by the trustees, and at the close of his studentship to make to the trustees and to the University of Cambridge a report on his work. He may also be required to deliver a lecture thereon.

Those who desire to enter for the studentship should apply immediately for a form of application to Prof. B. Melville Jones, Engineering Laboratory, Cambridge, and return their application not later than May 12th.

Another Jupiter Type Test.

A Bristol Jupiter engine—No. 878—was recently taken at random from a batch of 14 completed engines at the Bristol Works and mounted on the dynamometer where power and consumption curve figures were taken. It was then run for 20 hours non-stop at nine-tenths full power, and thereafter for three ten-hour periods, with a five minutes' burst at full throttle at the end of the first two ten hours. The last hour of the last ten-hour run was also at full throttle. The engine was found to develop more power at the end of this 50 hours of running than at the beginning, the difference at maximum r.p.m. being six h.p. On the conclusion of the test the engine was stopped and found to be in excellent condition.

At normal (1,575) r.p.m. the engine developed 398 b.h.p. at the beginning and 399 b.h.p. at the end of the test. At maximum (1,750) r.p.m. the power was 424 b.h.p. at the beginning and 430 b.h.p. at the end of the test.

The average fuel consumption throughout the test was .59 pints per b.h.p./hour, the consumption at full throttle was .582 pints per b.h.p./hour. Throughout the whole test the engine ran steadily and well.

Helicopting Again in Season.

With the coming of spring the French helicopter enthusiasts seem to have again started work. It is accordingly reported in the Press that on or about April 18th the Marquis Pateras Pescara covered a distance of 736 m. (800 yards) at a height of some three feet on his apparatus, at Issy-les-Moulineaux. The performance is claimed as a "record" and was observed by representatives both of the Section Technique and of the Aero Club.

M. Oehmichen, at about the same time, is said to have helicopted a distance of 525 m. (560 yards).

The April number of *Aero Digest* (the new title of that entertaining North American journal, familiarly known as *Aeronautical Indigestion*) brings news that Mr. Henry A. Berliner has recently demonstrated his new helicopter before high officials of the U.S. Army Air Service.

Belgian Developments.

The three-engined Handley-Page machine which is described elsewhere is destined for service in the Belgian Congo. This Congo service is one of the schemes which are being undertaken by the Société Anonyme Belge d'Exploitation de la Navigation Aérienne (Sabena) and the associated Société Anonyme Belge de Constructions Aéronautiques (Sabca), and it is of interest to sketch the development of Belgian Commercial Aviation during the past few years.

In 1919 the Société Nationale pour les Etudes des Transports Aériens (Sneta) arranged an experimental programme of air transport The services in Europe in 1920/21 were run in co-operation with Air Transport firms of other countries. The London-Brussels service ran in collaboration with Handley-Page Transport, the Amsterdam-Brussels route with the K.L.M., and the Paris-Brussels route with the Messageries Aériennes. In 1922 and 23 the Sneta ran a Belgian service by itself.

In the Belgian Congo the Sneta ran in 1921/22 an experimental service from Leopoldsville to Elizabethville, a distance of some 1,200 miles. The whole of the district covered by this service is covered by dense forests and practicable aerodromes are very far apart. Consequently seaplanes were chosen and the river Congo itself was followed. The service proved its value abundantly. At present travelling by boat the journey takes 45 days, and consequently a very great saving in the time of transit of mails, passengers and urgent goods is possible. But owing to the extremely arduous conditions—the route is practically on the equator—very serious trouble with the seaplanes was encountered. The hulls soaked up water in large quantities, and alternate immersion in the river and in the extremely heated air above played havoc with floats.

The value of such a service was however completely established, and when the Sabena was formed last year it was among its objects to operate not only European air services, but to develop the Congo line on an extensive scale. After a very thorough investigation of all the conditions involved, it was decided to use the three-engined Handley-Page as providing—so far as human ingenuity can secure—the most complete freedom from involuntary landings. In this decision the firm have been largely influenced by the very excellent performance on the London-Paris route of the twin-engined W 8.B. type, which differs only in engine arrangement from the machines which are to be used.

Further machines of the type needed for the operations of the Sabena will be built at the works of the Sabca under license from Handley Page Ltd., and when the line is in regular operation, the journey time over the Congo route will be reduced from 45 to 2 days.

It should be noted that the Sabena firm owes its existence very largely to the personal interest and material support of H.M. King Albert, to whose keen appreciation of the importance of aviation Belgium owes so much.

Air Ministry Notices to Ground Engineers.

NO. 4.—STANDARD STRAINING CORD IN AIRCRAFT.

It is hereby notified:

1. The use of straining cord which is protected against corrosion by galvanising *only* is prohibited on account of the unreliability of soldered joints, due to the difficulty of obtaining good adhesion between the solder and the galvanised surface.

2. Only straining cord with a tinned surface is permissible. The galvanising of the individual strands previous to the drawing of the wire is permissible provided the strands are subsequently tinned previous to the manufacture of the straining cord.

3. Galvanised *extra flexible cables,* however, are still permissible, as the splices of this class of cable do not require a soldering operation.

Air Ministry, April 15, 1924.

NO. 5.—ALUMINIUM SOLDERING OF BLOW-HOLES IN AERO ENGINE CASTINGS: PRECAUTIONS.

It is hereby notified:

1. No process of aluminium soldering or welding has been approved by the Air Ministry for the repair of broken or cracked aero engine parts.

2. Any small blow-holes that are found in accepted castings and are unlikely to influence the strength or reliability of the part should be left untouched. To secure a sound oil or water-tight joint face, however, a screwed plug should be applied to the filling of the defect wherever possible.

3. If screwing, as in paragraph 2, is not feasible, aluminium soldering may be employed, provided that the blow-hole is such that the filling is properly keyed into the casting so that it cannot shake loose under vibration. The part to be treated should be uniformly heated up to a temperature not exceeding 250 degrees C. in a suitable oven or furnace providing an even and controllable temperature. The small blow-holes to be filled must be carefully scraped and scratch-brushed before soldering, after the completion of the heating operation, and no flux must be used. A blow lamp is not under any circumstances to be used in the soldering operation, but a soldering iron only. Details of the process as carried out should be recorded in the engine log book.

Air Ministry, April 15, 1924.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 5; Tuesday, 7; Wednesday, 7; Thursday, 9; Friday, 5; Saturday, 9; Sunday, 3.

London—Paris :
Imperial Airways, Ltd., machines 2, passengers 3, freight —
Paris—London :
Air Union, machines 33, passengers 167, freight 19,652 lbs.
London—Rotterdam :
K.L.M., machines 10, passengers 28.
Special Machines : 0.

Total number of trips by British machines : 2, carrying 1 pas. Foreign machines : 43, carrying 195 passengers.

Comparative Figures :
For week ending April 27 :
Machines, 45; Passengers, 196; Crews, 72; Total personnel, 268.
Corresponding week, 1923 :
Machines, 83; Passengers, 371; Crews, 131; Total personnel, 502.
Corresponding week, 1922 :
Machines, 104; Passengers, 193; Crews, 134; Total personnel, 327.
Corresponding week 1921 :
Machines, 52; Passengers, 206; Crews, 56; Total personnel, 272.
Corresponding week, 1920.
Machines, 44; Passengers, 44; Crews, 46; Total personnel, 90.

Croydon Notes.

Mr. Robertson came to the rescue of British Aviation on Saturday and took a D.H.34 which he had tested the previous day to Paris. He returned on Sunday. The machine was the ex-Daimler G-EBCX. Mr. Robertson has long been considered one of the best commercial pilots and was lately chief pilot to the Daimler Airway in which concern he has worked for two years under Major Woods Humphery. The fact that he has had more experience than any other pilot of Major Woods Humphery as a general manager and is content to go on working for him seems in itself significant.

Mr. Robinson, formerly of the Berkshire Aviation Company, later of the Daimler Co., still later of the Instone Line, and later still of the Daimler Co. again, has also joined Imperial Airways Ltd. He is certainly one of the most reliable and experienced of civilian pilots and his return to work is a healthy sign.

Otherwise the foreigners had things almost their own way again this week and carried just under 200 passengers. The Air Union carried 19,652 lbs. of goods on the Paris route during the week.

An unfortunate incident has marred the hitherto unbroken success of the K.L.M. On Thursday Fokker H-NABS left Croydon at 10.43 hrs. piloted by Mr. Pyl with one passenger goods and mail. It landed at Lympne to pick up a passenger and owing to the weather stayed there until 13.30 hrs.

It so happened that one was at Folkestone at the time and saw the machine pass. The weather was not at all bad as a Goliath passed over shortly afterwards flying at a height of at least 2,000 ft. and it could be followed with glasses several miles out to sea, which shows that visibility was not bad. From the time the Fokker left the coast nothing further was heard of it and it is thought that either it fell into the water through engine failure and was broken up by the rough sea or that it failed structurally in the air when over the sea.

The Royal Aero Club and the S.B.A.C.

The Joint Standing Committee is now composed as follows :—

Royal Aero Club :—Maj.-Gen. Sir W. S. Brancker, K.C.B., Lt.-Col. M. O. Darby, Lt.-Col. F. K. McClean, A.F.C., Lt. Col. A. Ogilvie, C.B.E.

Society of British Aircraft Constructors :—Capt. H. E. P. D. Acland, Sqdn.-Commander James Bird, Mr. C. R. Fairey, Mr. H. T. Vane.

Secretaries :—H. E. Perrin and C. V. Allen.

The Joint Standing Committee met on Mar. 27 and Apr. 2 and 16, 1924.

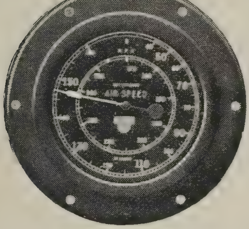
The King's Cup Race.

The Joint Committee after consideration were in favour of the King's Cup this year being confined to seaplanes. The Society urged that the course should be round England and the Southern part of Scotland. This would mean a course of approximately 1,400 miles occupying, with the necessary stops at the various towns en route, three days. The Royal Aero Club has sent a deputation to the Under-Secretary of State for Air, with a view to obtaining permission from the Air Council for Service Machines and Service Pilots to take part. This suggestion, however, has not been agreed to by the Air Council. The Joint Committee are now preparing a list of machines which might be available for the Race.

The Schneider Trophy.

A sub-committee of the Joint Committee has been appointed to make all the arrangements for the two British competitors in the Schneider Race to be held at Baltimore, U.S.A., in October next. The Sub-Committee is as follows :—Lt.-Col. M. O. Darby, Sqdn.-Commander James Bird, Mr. H. Burroughes, Mr. Basil Johnson and Mr. H. T. Vane.

Instrument Chats
(No. 25.)



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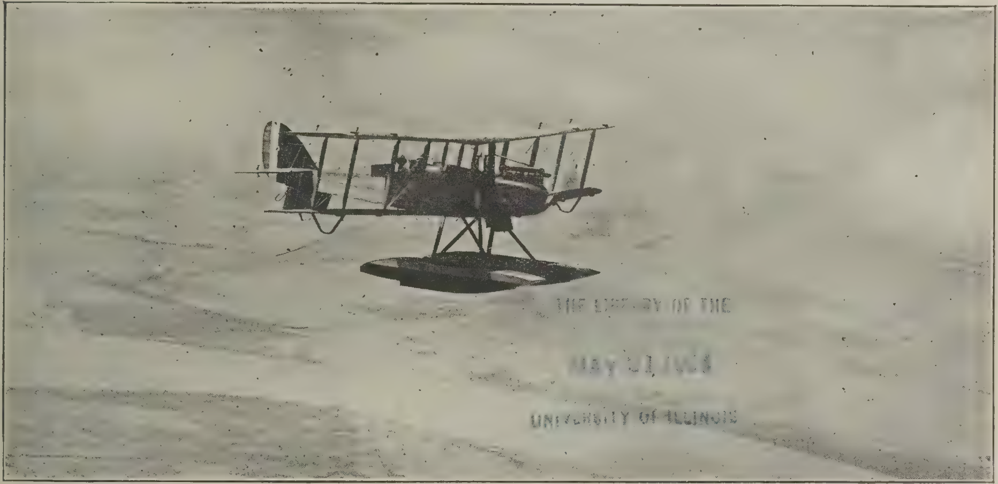
Vol. XXVI. No. 19. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"ON THE ROAD TO MANDALAY."



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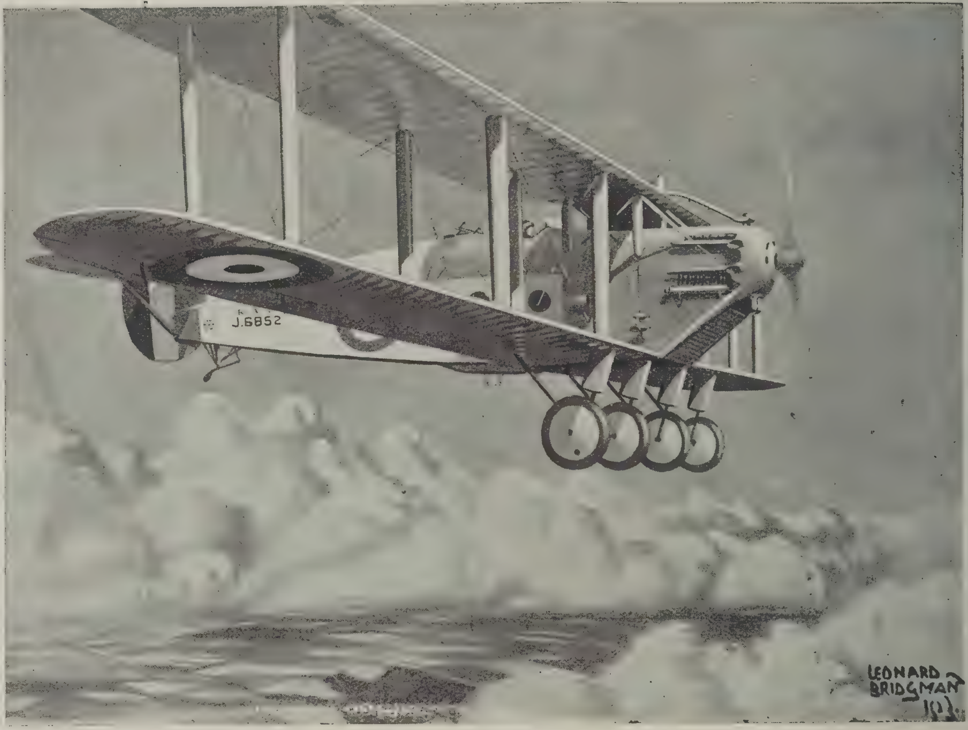

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This Bomber is a further development of the AVRO "Aldershot," which won the Air Force Handicap at the R.A.F. Pageant, 1922. It is fitted with dual control, and the whole of it, with the exception of certain parts of the wings, is constructed of metal. The wings are designed to fold back so as to economise space when the machine has to be stored.

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MAY 7, 1924.

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Incorporating
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VOL. XXVI. No. 19.

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ON THE PLUNGING AEROPLANE.

In the days long past when the Hippodrome was in fact a *dromos* in which hippic displays, commonly called circuses, were held the "great attraction"—the abominable verb "to feature" had not then been invented and the adjective "attractive" had not then assumed its present all-pervading connotation—was a show in which sundry performing elephants slid down a species of waterchute and alighted in the flooded arena with a fountainous splash. At a later date Somebody's "Plunging Horses" were the chief draw in a somewhat similar spectacle. It seems right and proper therefore in these days when we hope to make a success of aerial transport with the consent and assistance of well-paid young gentlemen who for agitational purposes class themselves as transport drivers but resent the classification socially that our modern transport animal, the aeroplane, should also give a plunging exhibition.

The exhibition was arranged by the Technical Department of the Air Ministry and took place in Harwich Harbour just off the Marine Experimental Station at Felixstowe on May 2. So far as one can gather the show, which was what a provincial play-bill called "for one consecutive performance only," was a strictly private experiment, on the lines of what W. E. de B. W. calls "a secret known to everyone except ourselves." That is to say nobody was allowed on pain of death to enter the sacred precincts of the Marine Experimental Station, and certainly no official invitation to view was sent to THE AEROPLANE. But the aeroplane made its plunge close to the jetty of the Felixstowe-Harwich ferry and most people concerned with aviation knew the time of the performance a day or two before it happened.

One would have imagined that in the interests of Civil Aviation the Air Ministry would have invited everybody concerned with commercial flying to witness the experiment, seeing that it is one of the most important things that has happened for some time. It is in fact part of the series of events which have recently made for progress in air transport, such as the flying of the first passenger-carrier with variable-camber wings and the testing of the first British three-engined machine, and so should have been made as public as possible.

The disappearance of one of the Royal Dut [illegible]
(K.L.M.'s) Fokker monoplanes in the Chan [illegible]
first grave mishap to a wonderfully [illegible]
showed that apart from reliability [illegible]
to alight slowly, it is essential [illegible]
aeroplane should be able to ali [illegible]
for many hours. This [illegible]
machines flying across th [illegible]
necessary in all air-lin [illegible]
occasions on which an [illegible]
tainous or thickly af [illegible]
those on board an [illegible]
could land at a [illegible]
mountain side or [illegible]
ground in a heap. [illegible]

The experiment [illegible]
to-day is an unsa [illegible]
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demonstrations [illegible]
provides yet [illegible]
right in the se [illegible]
Aviation with [illegible]

The machi [illegible]
Napier Lion [illegible]
age load of [illegible]
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had been pa [illegible]
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The pilot, [illegible]
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what would [illegible]
ground. Or [illegible]

drag which threw the machine onto its nose in what looked like a straight dive. The lower planes were entirely submerged and the upper planes went under water up to the rear spars. In a moment or two the machine emerged somewhat ("bobbed up like a cork" as an onlooker said) and settled with the leading edge of the upper plane under the water and the trailing edge of the lower planes above the water and the fuselage at an angle of about 45 degrees.

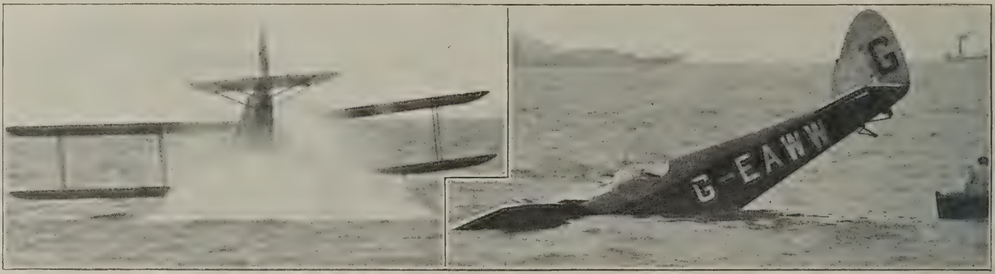
As the machine plunged the pilot was nearly thrown over the edge of the cockpit. If it had been a D.H.34 he would have gone clean under and would have had some difficulty in extricating himself. It is more probable that he would have been stunned by the shock of the water and would have been drowned. In this case Mr. Rea waited until the machine had adjusted itself before he left the cockpit, and put into it some ballast brought out by a motor-boat to replace his weight. The machine then settled down with the fuselage at an agle of 30 degrees, possibly owing to the air escaping from the trailing edge of the lower planes. The engine was, naturally, completely under water.

For some 15 minutes there was no marked tendency to sink, but thereafter the loss of buoyancy was noticeable and after 25 minutes the water was in the pilot's cockpit. Then a boat took the machine in tow to a buoy, to prevent it from drifting out on the tide. The towing of course tended to force the nose still further under water and accelerated the sinking and the nose of the machine touched bottom in about 30 minutes after the alighting, but apart from that it was clear that so far as the particular machine was concerned it would not have been safe to trust it to float for more than half an hour.

The lessons to be learned from the experiment are many and valuable. They may be catalogued briefly thus:—

(A) Every passenger machine (in fact every aeroplane) should be made so that it will float till actually broken up by heavy seas. This may be achieved by fitted flotation bags, but it ought to be done by making the major portion of the planes (allowing for inspection plates) water-tight, and the whole fuselage should be as water-tight as a boat.

(B) [illegible]chine should be designed so that [illegible] of tripping over [illegible]



THE PLUNGING AEROPLANE.—At the moment of impact and after the removal of the pilot.

sponsible for air transport take action as the strong silent men which we all imagine them to be, or at any rate hope that they are.

(D) It will be a still graver error if the air transport people try to escape responsibility for the safety of passengers by using "fake" devices to give the impression of safety.

One writer advises "semi-flotation device to counterbalance the weight of the engine in the tractor type," forgetting that whether tractor or pusher the centre of gravity of an aeroplane must be in the same relation to the centre of pressure of the wings and that the attitude of flotation on the water will be the same in either case unless the fuselage is designed to float properly. The idea of putting the "emergency exits" in the roofs of cabins sufficiently far aft to keep them out of the water is merely silly, for the whole cabin should remain level when and after alighting. "Flotation gear in the shape of air buoys expanded by compressed air" are equally inadmissible, for they are liable to deteriorate and leak and so are not reliable as a permanent fitting, though excellent as an emergency gadget when a land machine is used temporarily for over-water work.

What is needed for the good of Civil Aviation is a complete new fleet of passenger machines designed throughout in the light of these three recent demonstrations. It was precisely with the object of producing improved transport machines that the Government subsidy of £1,000,000 was offered. Merely piling up mileage with obsolete aircraft is a positive disadvantage, for if the perfection of repair-shop organisation, as in the deceased Daimler Airway, minimises breakdowns and accidents, it definitely postpones the production of aeroplanes and engines which are in themselves reliable and safe.

Passengers by air should do their journeys in safety because of the enterprise of air-line directors and the intelligence of aeroplane and engine designers and not thanks to the skill of aerodrome mechanics and the brain-sweat of running-shed managers. The Directors of Imperial Airways Ltd. have a wonderful opportunity of enhancing their individual reputations and of conferring a benefit on humanity in general and on the British aircraft trade in particular by ordering the production of modern passenger aeroplanes. Let us hope that they will not miss that opportunity. Let them, like the aeroplane at Felixstowe, take a plunge and be prepared to sink or swim on their merits.—C. G. G.

The Air Line Argument.

On May 2 Imperial Airways Ltd. issued the following statement.

The Imperial Airways, Ltd., announce that an agreement has now been reached, to the satisfaction of all concerned, between the pilots, mechanics, and ground staff of the absorbed air transport companies and the Imperial Airways, Ltd., and services will be resumed on Monday next.

So far as one can gather the chief point at issue, namely, the combining in one person of the post of General Manager and Chief Engineer, has been settled by a compromise. This consists in appointing yet another official to the company whose duty will be to decide whether the pilots are to fly or not and which pilots are
He

The Flight Round Australia.

Wing Commander S. J. Goble and Flg. Off. McIntyre, R.A.A.F., who are flying round Australia, had on reaching Broome, W.A., on Apr. 28, covered 3,865 miles since leaving Melbourne on Apr. 6.

When they landed at Napier in Broome Bay (recommended by Lord Jellicoe as a most suitable site for a naval base) the crew took the precaution of going ashore armed owing to the number of aboriginals who had assembled to watch the strange sight of men flying like birds. The natives however were quite friendly and held a "corroboree" in the aviators' honour.

On Apr. 29 they left Broome and arrived at Onslow a dis-
of 340 miles.
they left Onslow and reached Carnarvon after
Samson to the west of Roeburne making the
aving Melbourne over 5,000 miles.
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pected to reach Fremantle on the
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for some days.

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Zaharoff, £21.
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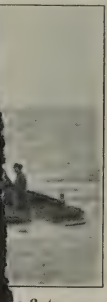

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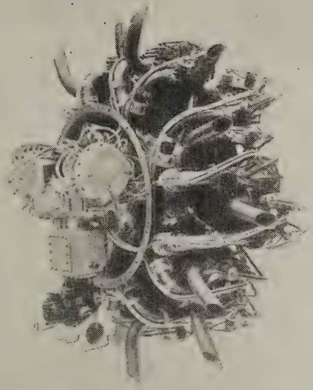

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At normal speed, 1,600 r.p.m., 350 b.h.p.
Petrol Consumption, ·55 pts./b.h.p.
·312 Litres per b.h.p. hour.
Oil Consumption, ·03 pts./b.h.p.
·017 Litres per b.h.p. hour.
Weight, complete:
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THE "Lynx" is an ideal engine for Training Aircraft. It is most accessible—being superior in this respect to any other aircraft engine.

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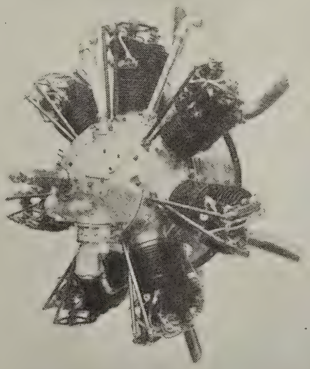

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THE IRRAWADDY SURVEY.

By C. G. GREY.

Many of those who are interested in commercial flying are of the opinion that one of the most valuable sources of income to aircraft firms and to individuals who hope to make a living out of civil aviation will be aerial survey work. Some even believe that this particular phase of flying will be more profitable and will provide more employment than will the running of air lines for a great many years to come.

There is much to be said for this argument because for a given number of hours flown or for a given number of miles covered air lines on account of their cut and dried organisation can operate with less material and personnel than can air survey parties. Furthermore there is the interesting point that after air line work has settled down to the point where the pilots have become practically drivers of public vehicles over regular tracts properly equipped with signals there will still be plenty of adventurous flying over unknown country for pilots whose temperament could not stand the monotony of aerial transport driving.

One is moved to these remarks by the fact that of late one has had the good fortune to acquire a considerable amount of information about the survey of the Irrawaddy Delta. For the benefit of the geographically uninformed one may remark that the Irrawaddy River is on the road to Mandalay, of which Rudyard Kipling has sung, and is the main traffic route to Rangoon and the whole of Burma. It is therefore somewhat important that all its channels and that which they include should be properly charted.

This survey has now been completed with remarkable success after a very short period of actual work. The results when taken in conjunction with the results of various timber territory surveys in Canada and in the United States should provide firms who are interested in aerial survey with unanswerable evidence in favour of aerial map-making from the air.

The History of the Survey.

The Irrawaddy survey was first considered officially in January 1922, but the Government of Burma had been considering the subject unofficially for some time before. A provisional quotation from the survey of the Delta had been received but this did not include local transport base charges or housing and these in themselves looked like doubling the cost. By August 1922 when a meeting was held to consider the subject there were no firms actually ready to undertake the work. At any rate there were no British firms equipped to do so. The Bermuda and West Atlantic Aviation Company which had undertaken a survey of the Orinoco Delta had suspended operations at that time and the Aircraft Operating Company had not been formed. The Aerial Survey Company (Newfoundland) Ltd. were busy on their own affairs and there was no firm in England actually organised for survey work. The British Air Ministry was not prepared to undertake the operations as they held very rightly to the policy of allowing commercially organised companies to do all that there was to be done.

Ultimately the Burmese authorities approached Mr. Ronald Kemp who will be remembered as one of the pioneers of English aviation. He was at that time and still is Consulting Aeronautical Engineer to the Government of India. Mr. Kemp who had previously discussed the survey with the Burmese authorities thereupon submitted a scheme whereby the Forest Department of Burma should do the work themselves under his direction. The arrangement was that the Forest Department was to engage the necessary skilled personnel and to acquire the necessary material. This scheme was provisionally accepted and was passed through in the Budget for 1923.

Thereafter when the scheme came before the Finance Committee of the Burmese Government it was considered too experimental to be undertaken in the manner suggested. Consequently though the Committee were in favour of it on general principles they decided to sanction the expenditure only in the form of a definite contract. Mr. Kemp was asked whether he would himself undertake to do the work as a direct job, and after due consideration and after obtaining leave from the Government of India he decided to do so.

The actual contract was not settled until the last week in July 1923. But by good fortune most of the arrangements on the technical side had already been settled and it was just possible to get the work going in the following season. Ultimately the whole survey has been signally successful, in spite of all difficulties, and in spite of the distinctly hurried preparations at the last moment.

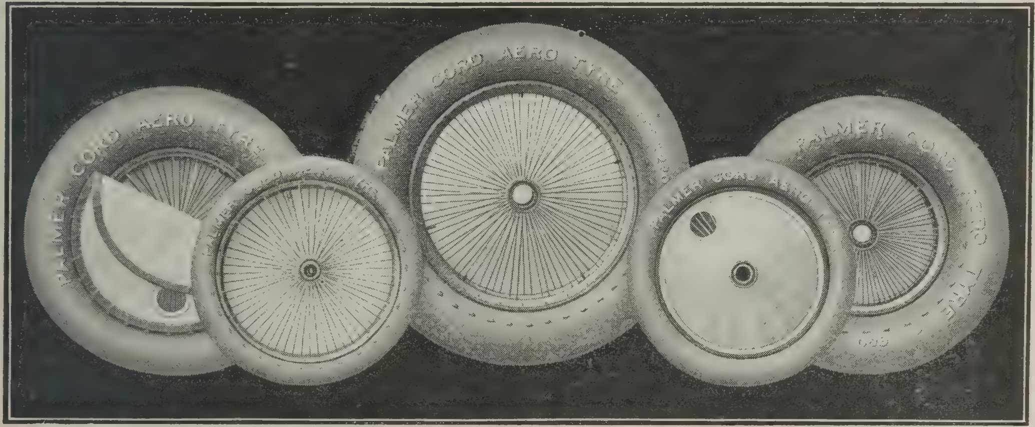
How the Work was Done.

The first actual contract was for the survey of an area of 1,050 square miles. This included not only the survey of the waterways of the Delta, which as the photographs show are distinctly complicated, but also several valuable forest reserves. The results of the first surveys were so gratifying and the photographs showed such a high degree of accuracy

RANGOON DOCKS.—Showing the Rangoon River in the foreground and the Pegu River in the background, with the Pazindoung Creek in the middle on the left.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104 46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104 46
,,	111	150.	38.09	104 46
700×75	78	178.	44.45	132 46
,,	79	178.	44.45	Central
,,	100	178.	38 09	132 46
,,	101	178.	31.75	132 46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132 46
,,	147	178.	55.	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38 09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	161*	185.	55.	135/50
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135 50
,,	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	150	185.	55.	Central
,,	167	185	55	125/60
,,	174	250.	80.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	201	185.	60.32	125/60
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×2 0	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 161, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.*
†Wheel No. 169 is fitted with Ball Bearings.

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S/NK (240)

and wealth of detail that the Government of Burma decided to extend the contract by including another area of about 350 square miles which embraced an adjoining forest reserve.

All the photographs and mapping of this 1,400 square miles had been completed by the end of March 1924 and since then the air surveyors have been engaged in mapping Rangoon itself.

The Delta Forests extend from the base at Rangoon to distances varying between 60 and 120 miles. The system under which the work was done, except for the nearest reserves, has been as follows :—

An advanced base consisting of a kind of houseboat launch with a motor-boat attached as a tender was established near the actual scene of operations for the day. The photographic machine for the day would leave early in the morning and would do about 3½ hours actual photographic work, and then after approximately 5 hours in the air would alight on the water beside the advanced base where the tanks would be filled up while the pilot and passenger had a meal. After this the machine would fly back to Rangoon.

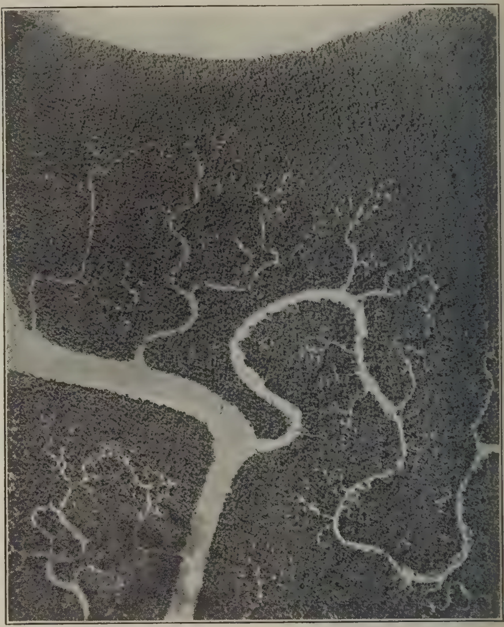
The plates would then be put through the dark rooms the same night, and as soon afterwards as possible a rough mosaic would be made so as to show whether any ground had been missed. Thanks chiefly to skill but also thanks to a certain amount of good luck the photographers were very fortunate in this respect. There were very few gaps in the mosaics when the photographs had been assembled.

There was practically no variation in scale, which showed that the pilots had maintained a constant height with considerable ability. And in no case did the photographs show any serious tilt. Consequently there was practically no repetition photography to be done, except where troubles with the shutters of the cameras had left actual blanks.

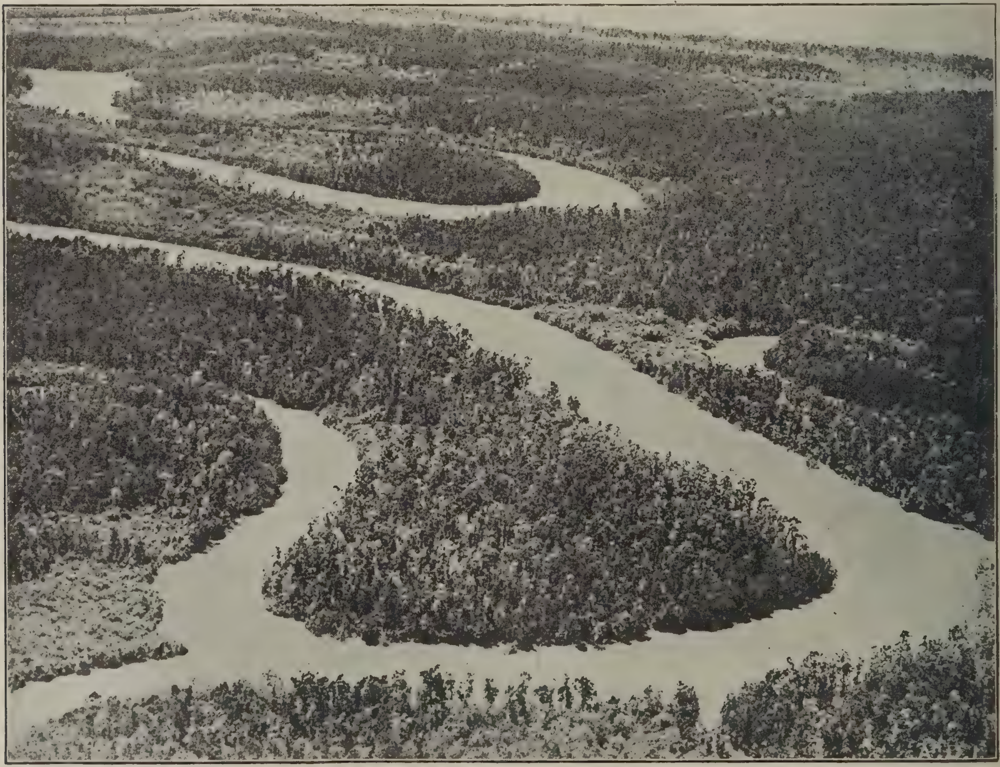
CAMERA TROUBLES.

The cameras used were of the Williamson L.B. type, which except for the shutters behaved very well. The focal plane shutters in the particular type of camera which was used gave a great deal of trouble and had to be altered altogether. In no case did the blinds last for more than 150 exposures and even then the self-capping action frequently failed, so that the aperture remained open when setting the shutter and fogged the unexposed plate.

The photographers overcame this trouble by fixing the aperture open and fitting a travelling plate or slide over the blind to prevent light from passing when setting. This of



A COMPLICATED CORNER.—Forest land in the Irrawaddy Delta.



THE IRRAWADDY SURVEY.—An oblique photograph of a forest in the Irrawaddy Delta, which gives some idea of the difficulties of ordinary survey compared with air survey.

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EXHIBITORS IN THE PALACE OF ENGINEERING,
BRITISH EMPIRE EXHIBITION.

RANGOON.—The Royal Lake with the famous Shwe Dagon Pagoda in the right background.

course interfered with the adjustment of the blind and gave the photographer a good deal of extra work to do because he had to remove the camera for stop adjustments whenever the light changed. But after all it can have been no worse than working with any focal plane shutter of the old type before the self-capping shutters were invented.

The Converted Aeroplanes.

The machines used were standard De Havilland 9s with Siddeley Puma engines. They were considerably modified on the spot and naturally all armament was removed. They were fitted with floats specially designed for river work by Mr. Kemp and built by Short Brothers of Rochester. There were two of these machines and they were both intact at the end of the survey. The pilots, who have had a great deal of experience of aeroplanes of all types, say that they made extraordinarily good seaplanes and were quite the nicest that they had ever flown or handled on the water.

Their performance was quite astonishing. The top speed was very little if any less than that of the standard D.H.9 fitted with wheels. The climb was very fair, as is shown by the fact that at noon in the semi-tropical climate of Burma they reached 10,000 feet in less than an hour and had a ceiling of something over 13,000 feet with full tanks for over five hours' flying, 365 lbs. weight in the passenger seat, and an anchor and rope. Considering that these 9s were fitted with standard wings and not with special high-lift wings this performance is remarkable.

The Puma engines were fitted with two magnetos and did very good work. At the start there was a little magneto trouble owing to the shellac melting off the armatures. This was responsible for one of the only two forced landings which occurred during the whole of the survey. The trouble was overcome by air-cooling the magnetos by means of air chutes. The second forced landing was caused by a cracked cylinder head.

A Slight Adventure.

On this occasion the machine, which was piloted by Major Cochran-Patrick with Mr. Durward as passenger, alighted in the main Irrawaddy river some 36 miles from the advanced base near a village named Hlaingbon. The inhabitants turned out about fifty war canoes and towed them ashore. There Mr. Durward spent an uncomfortable night on the floats fighting mosquitoes while Major Patrick made a record journey by night to the advanced base to get assistance.

He enlisted two picked villagers as motive power and piloted them, thanks to his aerial knowledge of the intricacies of the river, through a series of most difficult creeks in 8¾-hours' paddling with a two-hours' rest. The result was that the launch arrived by noon next day.

By that time Mr. Kemp had arrived on the reserve machine with a European mechanic, Mr. Bishop, and a Chinese. Unfortunately nothing could be done there so Major Patrick and Mr. Durward flew the reserve machine home and Mr. Kemp towed the derelict 90 miles to Rangoon with a motor-boat, which took two nights and a day of continual towing.

The Personnel of the Survey.

The whole of the operations were under Mr. Ronald Kemp as general manager and pilot. With him, in charge of all the flying arrangements, was Major C. R. Cochran-Patrick, D.S.O., M.C., who is associated with the Aircraft Operating Company.

Major Patrick had had previous experience of survey work of a somewhat similar nature in the ill-fated attempt to survey the Orinoco Delta. No experience in this life is ever wasted if it be properly appreciated and Major Patrick's South American experience turned out to be most useful in Burma. One is informed by an entirely unprejudiced observer that Major Patrick proved to be an extraordinarily steady pilot and put in 5 to 6½ hours in the air daily for days at a time. Considering that Major Patrick was a very young leader of a single-seater scout squadron with a brilliant reputation during the War one might have expected him to develop into a temperamental pilot who would consider a couple of hours a day adequate employment for very high pay. It would appear however that he had developed, besides his undoubted ability as an aviator, a distinct understanding of the needs of commercial flying as a business proposition. The success

OVER RANGOON.—A vertical photograph of the Shwe Dagon Pagoda.

PROGRESS

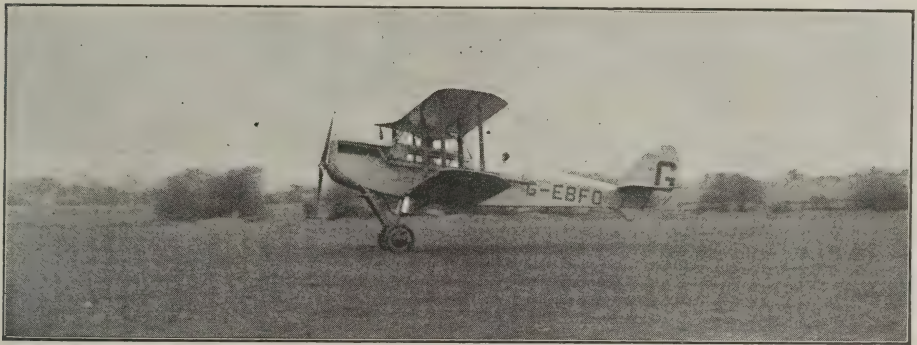
THE NEW DE HAVILLAND AUTOMATIC CAMBER GEAR

THE de Havilland Automatic Flap certainly seems to mark a distinct step forward . . . . The chief feature of the flap is that it is automatic in action, and this in itself is commendable, for the pilot in an emergency has as many points to engage his attention as he needs . . . .

The actual reduction in landing speed on the D.H.50 is estimated at about six miles an hour, but the test pilots say that, apart from this reduction, the use of the flaps enables a much greater reduction in the speed at which the pilot can approach the aerodrome. This amounts to as much as 10 to 15 miles an hour, and is really the result of the greater confidence the pilot has in the "feel" of the machine, which remains more on a level keel . . . .

The commercial value of the device lies in the increased speed range, which can be applied in various ways according to the requirements of the aeroplane.

The Times, 29th April, 1924.



Reproduced by courtesy of "Flight."

The D.H.50 fitted with the D.H. Automatic Camber Gear, Landing at about 40 m.p.h. Air Speed. The flaps are right down, and it should be noted that although the machine is very near its stalling angle the tail is well up.

THE standard type D.H.50 is a remarkable aeroplane in that with a Siddeley Puma engine it flies at a higher speed with four passengers and a pilot and luggage than did its progenitor the famous D.H.9. with two passengers and a pilot using the same engine. With the new wing-flaps it is just as fast, but it lands at something between 10 and 20 miles an hour slower. Also it glides slowly in a better attitude, with the tail well up so that the pilot can see where to alight instead of having his view blanketed by the lower planes. And when the pilot finally depresses the tail in the act of landing the machine drops quite flat for a few feet, the flaps acting then as air-brakes, and the machine practically stops dead in its tracks . . . . Which means that the flap-winged machine could get out of a small ground over tall trees or buildings when the standard type could not: or alternatively that it could get off the ground and climb slowly in a spiral path keeping inside the precincts of the aerodrome till high enough to start out across bad country or across an area of crowded houses and yet be always in a position to land back in the aerodrome in case of engine failure . . . .

A most important characteristic of the flap-winged D.H.50 is that it cannot stall and dive. . . . An attempt to stall it at apparently no miles per hour caused a gentle flat descent which turned into a slow forward glide within ten seconds and the nose never seemed to drop at all . . . .

The automatic nature of the flap control appears to have important practical advantages. The pilot has no extra operations to concern himself with, he cannot forget his flap-gear, nor can he misuse it. Furthermore the absence of control gear undoubtedly makes for the saving of weight.

The Aeroplane, 30th April, 1924.

THE machine got off after a very short run, and the climb appeared extremely good . . . . Capt. Broad gradually slowed down the machine, the air-speed indicator needle creeping back slowly to 60, 50, 45, and 40 m.p.h. When the needle touched the 40 m.p.h. figure the machine gently stalled. The recovery was extremely rapid, and it was estimated that the drop from stall until machine was again flying level (without opening the throttle) could not have been more than about 60 ft. It would appear that in recovering from a stall the spring-loaded trailing-edge flaps assist materially . . . .

. . . . As a matter of fact, the feeling of floating into an aerodrome at about 45 m.p.h. air speed with the tail still well up is wholly delightful, and gives a sense of security that must be experienced to be appreciated. On dropping to the ground the machine stopped its forward speed almost in its own length,

Flight, 1st May, 1924.

Application has been made for patents covering the de Havilland Automatic Camber Gear, and inquiries are invited from Aircraft Constructors desiring to employ the device in aeroplanes of their manufacture.

THE DE HAVILLAND AIRCRAFT CO., LTD.
STAG LANE AERODROME, EDGWARE, MIDDLESEX.
Telephone :—KINGSBURY 160-163 *Telegrams* :—HAVILLAND, EDGWARE.

DH

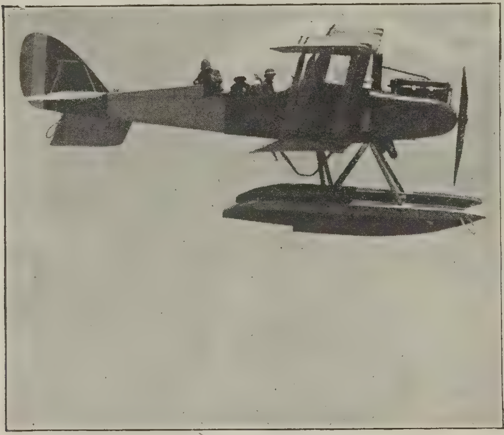
of the Irrawaddy survey is very largely due to his organising ability and his capacity for hard work, so he deserves congratulations.

The actual photographic work was mostly done by Flg. Off. J. Durward who was lent by the R.A.F. India. He had previously done a very large amount of good work in Iraq where he was responsible for quite a large proportion of the air-mapping which was done there. Naturally his experience of taking photographs and working photographic apparatus in the hot climate of the Orient were invaluable in Burma. The few photographs reproduced with this article will indicate to some extent how good his work has been.

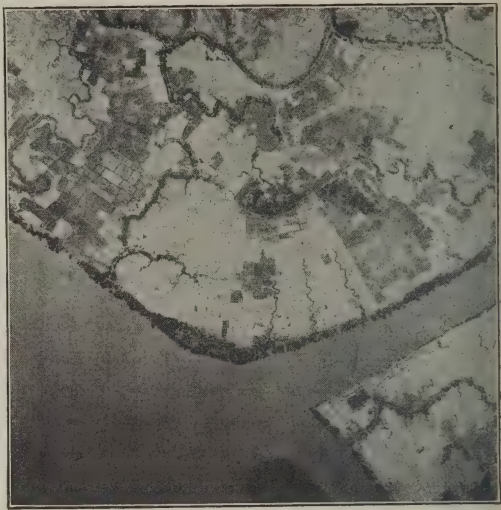
Under Mr. Durward there were one European and nine Indians who operated in two darkrooms, a washing and drying room, and map room and a camera repair shop. Up to the end of March they had produced nearly 4,000 negatives and three times that number of prints.

Mr. H. K. Armstrong who was in charge of the advanced base has had both photographic experience as a photographer in the Navy and aircraft experience at the Armstrong-Whitworth works at Newcastle. The three chief mechanics of the undertaking were Messrs. Bishop, Anderson and Parker. Messrs. Bishop and Parker are the passengers seen in the photograph of No. 1 machine which is piloted by Mr. Kemp.

In addition there were three skilled European mechanics, one storekeeper and eight skilled native hands, besides unskilled labour as might be required.



THE WORKERS.—Messrs. Kemp (pilot), Bishop and Parker (mechanics) on the No. 1 D.H.9 (Siddeley Puma engine).



AGRICULTURE IN BURMA.—A vertical view of paddy fields in the Irrawaddy Delta.

The photographs were taken at a height of 9,500 feet with a camera having a focal length of 6 inches, which gives a scale of about 3½ inches to the mile. These photographs when adjusted to scale and built into a mosaic have been handed over to Major Lewis, R.E., of the Government Survey of India, who is undertaking the completion of the maps.

Colonel C. P. Gunter, R.E., and Major Lewis, who are in charge of the survey on behalf of the Burmese Government, were responsible for all the mapping work in Mesopotamia during the War 1914-18. In the Irrawaddy Survey Major Lewis undertook the difficult work of fixing points around the coast and up the main rivers and creeks in the Delta. These points are now being used for the base lines to which the photographic work will be tied.

Altogether everybody concerned with the Irrawaddy survey is to be congratulated heartily on the success of what only a few months ago looked very much more like a sporting gamble than either a scientific or commercial proposition. It is to be hoped that this success will lead to considerably more work of a similar nature for the same excellent organisation and that it will encourage Governments and owners of large contracts of land to place further contracts for aerial survey work.

THE ROYAL AIR FORCE.

The London Gazette.

Apr. 29.

General Duties Branch.—Flt. Lt. N. P. Dixon, A.F.C., is granted a perm. commn. in the rank stated (Apr. 30); Flt. Lt. (Hon. Sq. Ldr.) R. H. Portal, D.S.C., is promoted to the rank of Sq. Ldr. (Apr. 1).

The follg. Plt. Offs. are promoted to the rank of Flg. Offs. (May 2):—H. V. Michell, R. V. M. Odbert, and L. E. Maynard. Flg. F. G. Edgington is placed on the retired list (Apr. 30).

Stores Branch.—A Davidson, M.C., is granted a S.S. commn. as a Flg. Off. for three years on the Active List, with seny of Apr. 1, 1918 (Apr. 25); R V. Robinson (temp. Capt., I.A.R.O.) is granted a S.S. commn. as a Flg. Off. for three years on the Active List, with effect from Apr. 22, 1924, and with seny of Mar. 10, 1919 (substituted for notification in *Gazette* of Apr. 15, 1924); Plt Off. W. R. Donkin is promoted to the rank of Flg. Off. (Apr. 26); Flg. Off. G. Bucknall resigns his S.S. commn. (Apr. 26) (substituted for the notification in *Gazette* of Apr. 8).

Medical Branch.—Flg. Off. K. R. Smith, M.D., D.P.H., relinquishes his temporary commn. on ceasing to be employed (Apr. 25).

Reserve of Air Force Officers.—The follg. Officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs. A. S. Keep Nov. 1, 1923); W. Cameron (Apr. 2); A. H. Dalton (Apr. 16); H. D. Humphreys (April 23); A. J. Winstanley (Apr. 23). Plt. Offs. P. G. Addie (Apr. 6); W. H. Herd (Apr. 23).

Memorandum.—The permission granted to Lt. J. J. Gowing to retain rank is withdrawn on his conviction by the Civil Power (Mar. 22).

Stores Branch.—Squadron Leader (Stores) W. J. Waddington, O.B.E., to No. 2 S.D., Altrincham, 1/4. Flight Lieutenant (Stores) L. E. Carter, D.C.M., to No. S.D., Altrincham, 1/4. Flying Officer (Stores) J. J. Ironmonger, to No. 2 S.D., Altrincham, 1/4; H. J. Bamber, to Aircraft Depot, India, 18/3; C. E. Tidy, to R.A.F. Depot, on transfer to Home Estab., 1/3; N. Dainty, to Air Ministry, 1/5.

Appointments.

Week ending May. 5.

General Duties Branch.—Wing Commanders J. N. Fletcher, A.F.C., to Special Duty List, on appointment as Air Attaché to the British Embassy, Rome, 1/5; H. A. Williamson, C.M.G., A.F.C., to R.A.F. Depot, on transfer to Home Estab., 1/5.

Squadron Leader O. G. W. G. Lywood, O.B.E., to H.Q., Inland Area, 1/5; F. H. Unwin, O.B.E., to No. 5 F.T.S., Shotwick, 22/5.

Flight Lieutenants P. Huskinson, M.C., to No. 10 Group H.Q., Lee-on-Solent, 19/5; G. Bowen, to No. 1 Group H.Q., Kidbrooke, 19/5; C R. Steele, to No. 1 Group H.Q., Kidbrooke, 22/5; M. A. Simpson, to R.A.F. Depot, on transfer to Home Estab., 28/4; H. N. Hampton, D.F.C., to No. 1 Group H.Q., Kidbrooke, 19/5; J. L. Vachell, M.C., to Air Ministry, 5/5.

Flying Officers P. Porter, to R.A.F. Base, Leuchars (No. 440 Flight), 24/4; E. A. C. Britton, D.F.C., to Air Ministry, 5/5; J. W. Lissett, to R.A.F. Base, Gosport, 12/5; H. F. Luck, to No. 1 S.D., Kidbrooke, 7/5; R. S. Barbour, to R.A.F. Depot, on appointment to a S.S. commn., 1/5.

Pilot Officer L. M. T. Maréscaux, to remain at No. 1 F.T.S., Netheravon, instead of to No. 7 Sqdn. as previously notified; F. E. Watts, to No. 15 Sqdn., Martlesham Heath, 8/5.

Medical Branch.—Squadron Leader (Medical) T. S. Rippon, O.B.E., to Superintendent of R.A.F. Reserve, Northolt, 1/5. Flight Lieutenant (Medical) W. R. Reith, M.D., A.M., to remain at R.A.F. Depot instead of to No. 56 Sqdn. as previously notified. Flying Officers (Medical) G. P. O'Connell, M.B., to Research Laboratory and M.O.S. of I., Hampstead, on appointment to a S.S. commn., 23/4; K. R. Smith, M.D., D.P.H., to Central Medical Board, Hampstead, 29/4.

Stores Branch.—Flying Officers (Stores) A. Davidson, M.C., to R.A.F. Depot, on appointment to a S.S. commn. 25/4. Pilot Officers (Accountants) W. F. Barrell, F. L Brown. D. F. A. Clarke, J. M. Hopkins, G. R. Keep, and S. C. Wyatt, to H.Q., Coastal Area, on appointment to S.S. commns. for course in Pay and Stores Accounting duties, 28/4.

Ypres.

The Editor of The Aeroplane acknowledges with thanks the receipt from an anonymous donor of a perfectly clean handkerchief "for favour of transmission to the unfortunate aeroplane depicted at the bottom of page 370 of issue number 18, vol. XXVI dated 30.4.24 of your periodical." The gift has been forwarded to the father of the child.

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THE PROHIBITION OF PRIVATE FLYING.

By W. H. SAYERS.

In an article on Accidents and Inspection in the United States published in this paper on Apr. 23 a reference was made to conditions in this country " where a paternal Government treats a would-be pilot as an eminently suspicious individual and practically prohibits anything of the nature of private flying."

This phrase seems to have surprised certain officials of the Air Ministry who are of the opinion that the British Air Navigation Regulations have done nothing to cramp flying and have succeeded in preventing a good many unnecessary casualties. It is necessary here to express the most profound sympathy with these gentlemen as individuals. They are undoubtedly possessed by the most excellent intentions, they are not lacking in intelligence as individuals and—as they see things—they have done their best to encourage Aviation in this country and at the same to prevent what appear to them to be possible occasions for unnecessary casualties.

THE DANGER OF OFFICIAL INTELLIGENCE.

There are to be found in the Air Ministry many officials for whose knowledge of aviation and for whose intelligent outlook on aviation it is possible to entertain the highest possible respect. Regarded as individuals one would listen to their opinions as to what an aeroplane should be, or under what conditions an air service should be operated, with the utmost willingness. Were one a financial magnate one would delight in nothing so much as in providing them with the necessary capital and setting them up in business to build aeroplanes or to run air lines according to their extremely interesting and ingenious ideas.

But when the same individuals in their capacity as Government officials say " This is how we are convinced an aeroplane should be built, and this is how we consider it should be operated in order to secure the greatest possible general public safety and utility " and add thereto the edict " Let no one on pain of the most severe penalties dare to build or operate aeroplanes otherwise " one can no longer regard them quite so complacently or so kindly.

In effect this is what the Air Ministry is attempting to do. They are practically attempting to supervise the design, construction, maintenance, and operation of every individual aeroplane of British manufacture and ownership in detail, and in the attempt they have been forced to lay down a series of rigid regulations which afflict each aeroplane in all of its doings from its birth to its final crash, and every pilot from his first flight to his last. Whatever may be said concerning this system of regulation and supervision it cannot be but either extremely complicated and expensive—or else merely pretentious and ineffective. It is in fact both. The cost of maintaining the Air Ministry's controlling and regulating staff is enormous, relatively to the small amount of flying which actually occurs in this country.

The Air Ministry so far as it is concerned with Civil Aviation has two ostensible purposes. One is to encourage flying, the other is to secure that flying is carried on with due regard to the safety of the public. On the ground that flying on an extensive scale cannot come about until public confidence in the safety of flying is established it has given its chief attention to attempts to make flying safe. So far its attitude is reasonable though not necessarily the only reasonable attitude. In effect it has only made flying safe in so far as it has put obstacles in the way of flying. It has pretty certainly not made flying as safe as it might have become by now because it has adopted an entirely fatuous method of trying to secure the desired safety, and because it has to a large extent concerned itself with looking after the safety of those who need not in any way concern it—for they are either capable of looking after themselves or else would be better left to their fate.

THE AIR MINISTRY'S FUNDAMENTAL MISTAKE.

The primary mistake made by the Air Ministry is that they have attempted to set definite standards of safety and to enforce their maintenance by regulation and by supervision. For example the Air Ministry has laid down that for civil aircraft which will not be stunted it is necessary that certain quite empirical standards of structural strength should be observed. And they proceed to prohibit the flying of any aeroplane which does not possess the specified load factors. The question of whether the machine complies with their requirements is determined by Air Ministry officials working to officially approved methods of calculation, and the Air Ministry thereupon certifies that a given machine has a load factor of say 5 for C.P. forward, 4½ for C.P. back and so on according to schedule and is therefore—in this respect—airworthy.

The consequence is that these particular requirements become standard. If an aeroplane breaks in the air the designer has only to show that the machine has been guaranteed safe in respect of structural design by the Air Ministry itself and nobody can cast aspersions on his work or call him to task for making a weak machine.

It must be perfectly obvious that no such schedule of structural strengths can be applied with equal justice and safety to machines of widely diverse structural and aerodynamic characteristics. If, as appears to be the case, the British schedule of load-factors does actually produce machines which are strong enough to be safe over the whole range of practical structural design, then it is fairly certain that the majority of machines to which they apply are stronger—and therefore heavier—than they need to be. And there is no sort of guarantee that applied to a machine of an abnormal design these same requirements will not prove to be too low.

PUT RESPONSIBILITY ON THE RIGHT SHOULDERS.

It should be the business of the designer to determine these matters in view of the general characteristics of the machine. The Air Ministry in effect removes from him all such responsibility and takes it upon itself. In so doing it adds very considerably to the cost of building aeroplanes, fetters the aeroplane designer and leads to stagnation in design.

By all means let the Air Ministry give the designers of this country the benefit of their enormous accumulation of data upon aircraft accidents and upon the loads which are likely to be encountered in flying.

Let them even get together the many undoubtedly able technicians whose services they can command to establish tables of standard load factors for typical aircraft of normal categories which they consider could usually be taken as producing a safe aeroplane.

But the onus of proving that a given aeroplane which had broken in the air was designed and built of adequate strength for its work—or as nearly so as the state of knowledge then existing would allow—should be upon the constructor and designer alone. Neither compliance with, nor disregard of the standard load factors should be regarded as proof that the designer and/or constructor has, or has not, completely discharged his responsibility in this matter—for it should be open to proof that special characteristics of the machine either permitted smaller or called for larger load factors than those of the standard schedule.

FUTILE FLYING TESTS.

Similar ridiculous attempts are made by the Air Ministry to superintend directly the whole of the details of flying throughout the country. Before anyone is allowed to fly the Air Ministry insists that he should demonstrate to them his ability to do so. Even in the case of the licensing of commercial pilots—that is those flying for reward or hire—the tests required are not and cannot possibly be any sort of guarantee that he who has passed them has more than a routine knowledge of how to perform a limited number of manœuvres on a machine operating under favourable conditions.

Even could the tests be made so thorough that only a thoroughly competent pilot could ever struggle through them it is no business whatever of the Air Ministry as to whether a given pilot knows how to fly properly. Their only legitimate concern is that in fact he should fly safely whenever he does fly. By setting a standard test for would-be pilots the Ministry is again taking upon itself responsibility which should be laid elsewhere.

In effect it says that providing you can pass these specified tests you know enough about flying to be trusted at large upon a certain class of aeroplane. Morally the pilot who crashes as the result of an emergency not presented to him in the scheduled tests has the right to say " I was not taught what to do in that particular emergency—you did not ask me to face it in the tests you imposed before granting me my licence. You have certified that I am a competent pilot although admittedly I do not know how to proceed in this particular set of circumstances and you have no right therefore to blame me for the accident."

THE RIGHT WAY TO SECURE SAFETY.

There is no need whatever for the Air Ministry to do more than to issue licences to fly at 5s. a year to all who like to apply for them merely by way of keeping a proper register of those who do fly. There is no need for them to do any more than to register and issue identification marks for any aeroplane that seeks to fly in this country.

They may in addition require some slight amendments to the common law of the land whereby the owner and/or pilot of any aeroplane will be liable for all damage to the property of others caused by that aeroplane, and in addition should be liable to prosecution and fine—or in serious cases imprisonment—for accidents caused by negligence and recklessness, and possibly for flying to the danger of others. As to this last one has some doubts. In theory of course it is an excellent and desirable safeguard—but recollections of law con-

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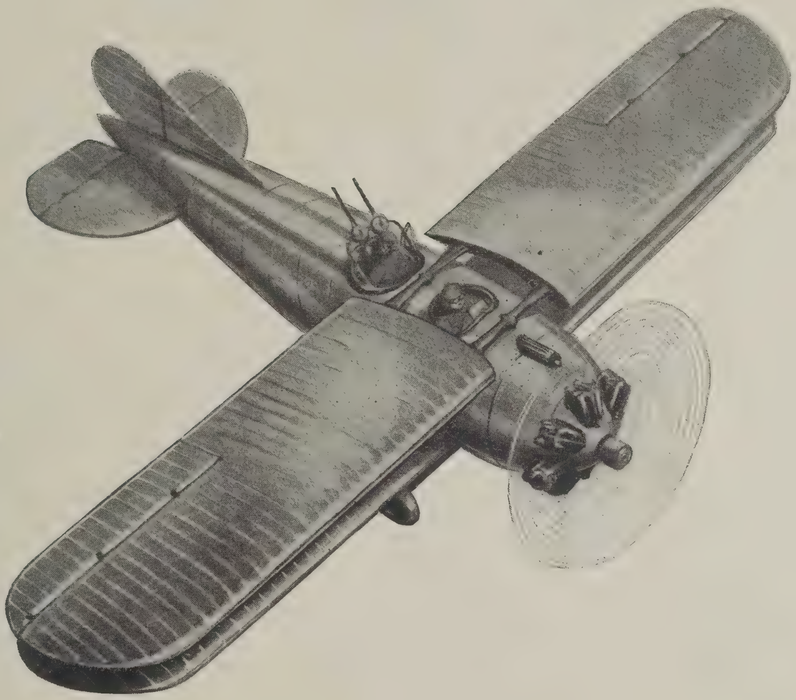

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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cerning the driving of cars to the public danger and of the view taken by normal benches of magistrates as to what constitutes driving to the public danger may cause one to wonder what chance a pilot who was seen over Kingston would have of keeping his licence.

Where the Ministry has no Business.

But the one thing that the Air Ministry has no sort of right to do is to try and prevent the private owner of an aeroplane from risking his neck on it. They may look after the public safety as much as they like. The right way to do that is to put the responsibility for causing danger to the public on the individual who has caused it. Instead of which they are attempting to say that if one is willing to fly under the rules and regulations which they have laid down, they will guarantee at least a degree of safety both to the public and to the flier. The task they are attempting is an impossible one—unless they go as far as to prohibit flying altogether. They have in fact already gone so far that to-day the private owner of an aeroplane cannot fly to any useful purpose without infringing the Air Navigation Regulations. According to the letter of the law flying is prohibited except under circumstances in which nobody particularly wants to fly.

What You Must Do to Fly.

Assume that you have bought an aeroplane, have paid for it and for the cost of acquiring Air Ministry approval of it and the documents testifying to that approval. Assume also that you have been medically examined (this is now necessary for the private pilot) and have passed the flying tests and have paid for your pilot's licence. Can one thereupon fly? No—there are several other formalities to be observed—that is presuming that you wish to go more than three miles from a recognised aerodrome. You must collect one ground engineer licensed to deal with your type of aeroplane and one licensed to deal with your type of engine to certify that your machine remains in its pristine state of airworthiness.

And you must do this on each and every day on which you desire to fly. Suppose that you wish to go away for a week-end. You leave your aerodrome and arrive duly in the vicinity of your destination. According to the law you should not land anywhere except on a licensed aerodrome, and being a law-abiding citizen you land at the nearest of such. You are indeed fortunate if it is closer to your destination than the aerodrome from which you started—but at any rate you have flown without breaking the law.

On Monday morning—or if you are one of those people who have business to attend to—on Sunday evening you proceed to the aerodrome to fly back. You seek for a ground engineer—to find that none of that locality are licensed to survey your particular machine or engine. And according to the law you may not fly home until you have imported the nearest qualified certifier to give you your clearance.

Evading the Law.

Of course in practice you do nothing of the sort You land in the handiest good-looking field and you come home without worrying about ground engineers. If anybody in authority says anything about your irregularity you say "I'm sorry—I was going to the next aerodrome in the particular direction but I ran out of petrol owing to a strong head wind and was forced to land. It was too late to go on so I stopped the week-end and then flew home." For "force majeure" is an admitted defence for breaches of regulations of this type.

In practice therefore anyone who wishes to fly in this country, and this is true whether he flies for his own private ends or "for hire or reward" can only do so either by confining his journeys to such as terminate at one of the few properly equipped and active aerodromes or he must break the law and be ready to lie to cover his offence. Those who have to fly have to put up with these conditions, and to face the risk that if the Air Ministry gets cross with them it can pretty certainly catch them out, and that if in the course of a technically illegal flight they are so unfortunate as to cause any damage to a member of the public the consequences of their having done so while infringing Air Navigation Regulations may be extremely serious.

The Average Man and the Regulations.

To the average man who would like to fly for his own amusement or even to get about his private business the fact that he has either to conform to a complicated and cumbrous ritual or else risk finding himself within the meshes of the law is the equivalent of total prohibition. Practical experience has shown the public how thoroughly irritating the comparatively simple regulations governing the conduct of a motor-car on the public roads can become in the hands of a zealous policeman and a petulant magistrate. They are not going to face the possible results of Air Navigation Regulation administered in a similar spirit.

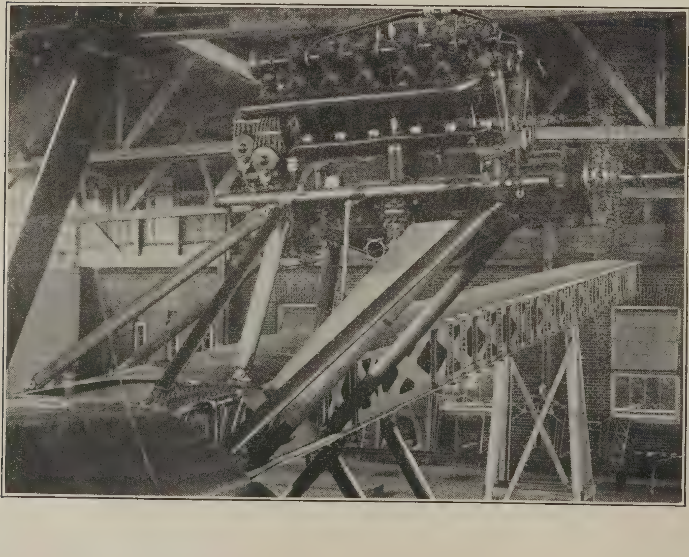
It may be said that in any case there are very few average men who would like to fly, and that it does not matter very much whether they are allowed to fly or not. This is a very doubtful argument. About 25 years ago the same might have been said about motoring—which was then prohibited.

But in fact it was the private motorist—the sportsman who refused to obey the ridiculous laws then in force—who first of all broke the law and put it out of action and then proceeded to familiarise the people of this country with the fact that the motor-car was not the dangerous Juggernaut which they had imagined. It is to the early private motorist that we owe the fact that to-day the general public accepts the motor vehicle as a safe and useful method of transport for both its person and its goods.

It is not improbable that history will show that a very similar state of affairs will hold in regard to the development of air transport. The operation of organised air lines on a scale such as is now possible has an almost infinitesimal effect on the public. Fifty or a hundred light aeroplanes in the hands of sporting youngsters who would use them at week-ends and on fine evenings to run out into the country for dinner—a drink—or just for the fun of going out—might do more to accustom the general public to the idea of the aeroplane as a vehicle which they themselves might on occasion use, than all the air lines are likely to do before they have spent our £1,000,000.

And if a few of these young sportsmen do break their necks in the process—well their friends will regret them but the public will forget—and so may the Air Ministry. After all they will be a long way from the first who have died for the good of flying—and if the Government feel that there is a duty laid upon them to prevent fatalities of this nature why did they neglect that duty between 1909 and 1914?

Either flying has to stop which is practically what the present standstill amounts to or the few survivors of those who believe in the value of aviation must be allowed to risk their necks at the call of their own faith. They will not do it for faith in the wisdom of a Government Department.



THE ROLLS-ROYCE ENGINE IN DENMARK.—This photograph shows the mounting of one of the Rolls-Royce Eagle IX engines in the Rohrbach flying boat built by the Rohrbach Metall Aeroplan A.S. of Copenhagen. Photographs of the machine were published in "The Aeroplane" for Jan. 2, and another photograph of the engine mounting was reproduced on April 2.

The evident accessibility of the engine when the cowling is removed is noteworthy.

The characteristic wing structure is of interest. It can be seen that the front and rear wing spars together with the metal covering between them form a box-girder unit, the leading edge being a separate attached structure.

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Air Ministry Notice to Ground Engineers.

No. 6, 1924.—ENGINES IN CIVIL AIRCRAFT: RUNNING SPEEDS. It is hereby notified:

1. The approval of engines for civil aircraft is based on the satisfactory completion by a representative engine of type tests, and the Certificate of Airworthiness of an aircraft is subject to the continued use of the engine in the aircraft under the conditions of power and speed upon which this type approval was granted.

2. As a result of each such type test "maximum" and "normal" engine speeds are laid down. The running of engines at, or in excess of, the maximum permissible speed, for more than a few minutes at a time in emergencies, is prohibited, since it inevitably tends to the early deterioration of the engine and increases its liability to breakdown.

The following table gives the normal and maximum permissible speeds of all British built airworthy engines:—

Engine.		R.P.M. Normal.	R.P.M. Maximum
B.R. 1	150 H.P.	1,250	1,300
B.R. 2	200 H.P.	1,300	1,350
Gnome Mono	—	1,250	1,300
Le Rhone	80 H.P	1,250	1,300
Le Rhone	110 H P	1,300	1,350
Beardmore	120 H.P	1,300	1,400
Beardmore	160 H.P.	1,350	1,450
Green	35 H.P.	1,250	1,300
Green	100 H.P	1,250	1,300
R.R. Hawk II	—	1,500	1,600
Siddeley Puma	—	1,400	1,500
Sunbeam Dyak	—	1,200	1,400
R.R. Falcon III	—	2,000	2,200
R.R. Eagle VIII	—	1,800	1,900
R.R. Eagle IX	—	1,800	2,000
R.R. Condor I and II	—	1,650	1,800
R.R. Condor III	—	1,900	2,100
Sunbeam Maori III	—	2,100	2,200
Sunbeam Manitou	—	2,000	2,100
Wolseley Viper	—	2,000	2,100
Napier Lion	—	2,000	2,200
Bristol Jupiter IV	—	1,575	1,750
Bristol Lucifer	—	1,600	1,760
Bristol Cherub	—	2,200	2,500
Siddeley Jaguar III	—	1,500	1,650
Siddeley Lynx	—	1,620	1,780

By Command of the Air Council,
W. F Nicholson.

Air Ministry, London, W.C.2. Apr. 24, 1924

New Technical Literature.

Aeronautical Research Committee. R. & M. No. 882. An Investigation of Downwash in the Slipstream (Part 1). By L. F. G. Simmons and E. Ower. With an appendix by H. Glauert. Price 1s. net.

R. & M. No. 889. Experimental Tests of the Vortex Theory of Aerofoils. By H. Glauert. Price 9d. net.

R. & M. No. 890. Scale effect on Struts and Drag of Wiring of a Bristol Fighter. Correction of Model Tests for Comparison with the Full Scale. By F. B. Bradfield. Price 9d. net.

The Belgian Light Aeroplane Meeting.

An international meeting is to be held on June 16 and 17 at the aerodrome of Evere, Brussels, for light aeroplanes. The contest is to be organised by the Aero Club of Belgium.

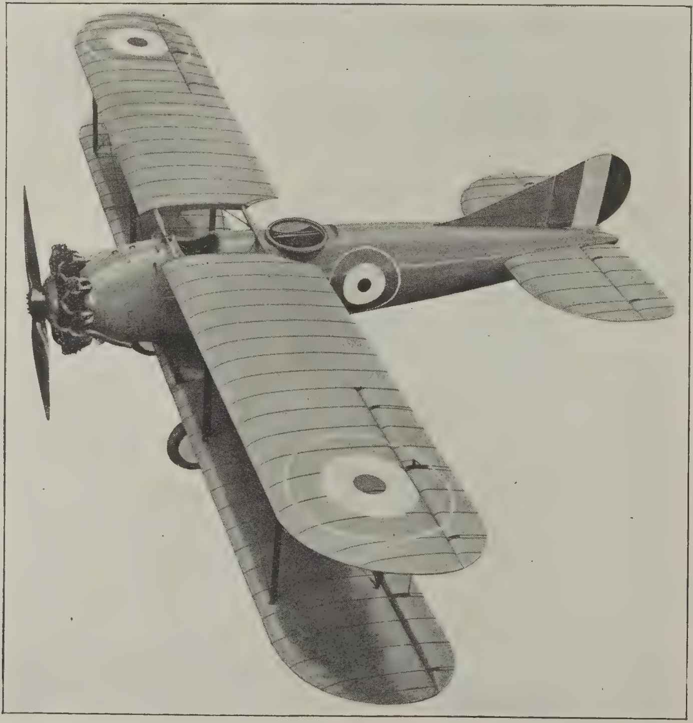
Machines are limited to engines of a cylinder capacity of 1,100 c.c. for single-seaters and 2,000 c.c. for two-seaters and the contests are to be regulated by F.A.I. rules. Machines must be provided with certificates of airworthiness of their country of origin.

The tests are to consist of:—(1) a qualifying flight over the course Brussels-Gossoncourt-Bierset and return with compulsory landings at each of the named aerodromes. This test must be accomplished between 8 and 18 hours June 16; (2) a getting off test involving measurement of the distance from the wheels at rest to the last point on the ground touched by the wheels in taking off; (3) a pulling up test, measured by the distance between first contact of wheels with the earth on landing and the position of the wheels when the machine has come to rest; (4) a test of portability and ease of dismantling. Machines must be folded or otherwise reduced in dimension to pass through a gateway 2.5 m. (8 ft. 2½ in.) wide, transported 100 metres, and reassembled into flying order in not more than 60 minutes. This test must be carried out by the crew with not more than one assistant and with the aid only of tools and equipment carried on the machines. Machines will be penalised 1 mark per metre of the distance required to take off and to pull up in tests (2) and (3) and 1 mark per minute required for test (4), the minimum of penalties corresponding to the best performance.

The first prize which is international consists of 10,000 francs and the right to hold for one year a cup known as the Coupe des Avionnettes of a value of 1,500 francs. Second, third and fourth prizes of 15,000, 5,000, 3,000 and 2,000 francs respectively are reserved for Belgian entrants. Inquiries for full details may be made to the Secretariat de la Commission Sportive, Aéro Club de Belgique, 73, Avenue Louise, Brussels. Entries accompanied by an entry fee of 100 francs should be made not later than June 1 to the treasurer of the club. It should be noted that the rules have been so drawn up that competitors for this contest are also eligible to take part in the contest for the King of the Belgians' Challenge Cup for touring aircraft of not more than 70 h.p.

Italian Progress.

Signor Baciocchi, the editor of that excellent Italian monthly aviation publication L'Aerea, announces that he has now started a weekly edition of the paper. He also proposes starting very shortly a monthly edition of L'Aerea in several languages, which edition will be confined solely to Italian aeronautics. This publication should prove of use to those people interested in aviation in other countries as well as in Italy. Nobody could be more competent to make a success of both these papers than Signor Baciocchi, who is exceedingly well informed on aeronautical matters.



ALL METAL.—A photograph of the All-Metal Short Springbok after sundry retouchings—some of them dictated by considerations of appearance and others by a desire to meet the wishes of the Air Ministry.

The Springbok is a two-seater Corps Reconnaissance machine, fitted with the Bristol Jupiter engine of 400 h.p., built entirely of steel and duralumin even to the covering of wings and control surfaces.

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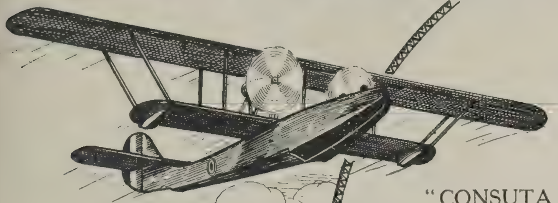

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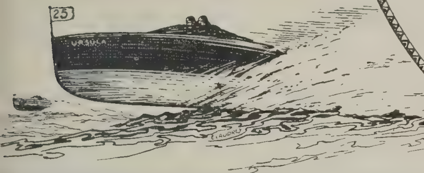

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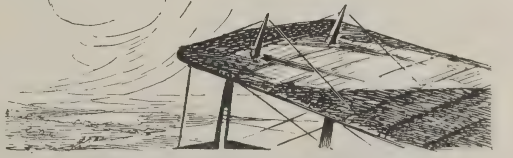

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The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 3; Tuesday, 10; Wednesday, 0; Thursday, 9; Friday, 8; Saturday, 5; Sunday 9.

LONDON—PARIS AND LONDON—COLOGNE:
Imperial Airways, Ltd., machines 14, passengers 19, freight —.
PARIS—LONDON:
Air Union, machines 19, passengers 64, freight 18,729 lbs.
LONDON—ROTTERDAM:
K.L.M., machines 8, passengers 16.
SPECIAL MACHINES:
De Havilland Hire, machines 3, passengers Nil.

Total number of trips by British machines: 17, carrying 19 pas. Foreign machines: 19, carrying 64 passengers.

COMPARATIVE FIGURES:
For week ending May 4:
Machines, 44; Passengers, 99; Crews, 75; Total personnel, 174.
Corresponding week, 1923:
Machines, 117; Passengers, 475; Crews, 191; Total personnel, 666.
Corresponding week, 1922:
Machines, 109; Passengers, 234; Crews, 156; Total personnel, 390.
Cororesponding week, 1921:
Machines, 65; Passengers, 227; Crews, 79; Total personnel, 306.
Corresponding week, 1920:
Machines, 84; Passengers, 126; Crews, 96; Total personnel, 222.

Croydon Notes.

Last week was a poor one for the passenger traffic owing to the continued bad weather. Less than 100 passengers were carried.

Messrs. Robertson and Robinson carried on the work of Imperial Airways Ltd. On Monday Mr. Robinson made a return trip between London and Paris on G-EBCX and on Tuesday Mr. Robertson did likewise. There was no flying at all on Wednesday. Mr. Robertson did another Paris return flight on Thursday and Friday and on Friday Mr. Robinson made a single trip to Cologne on G-EBBY.

Mr. Robertson made a return flight to Paris again on Saturday and a return flight to Cologne on Sunday on which day Mr. Robinson flew from Cologne on BY.

Other British aviation which occurred during the week was a flight on Saturday by Mr. Hubert Broad on a D.H.50 to Ostende. He returned on Sunday afternoon and then went back again to Ostende.

The Air Union and K.L.M. carried on as usual. The former carried 18,729 lbs. of freight.

Now that the pilots' dispute has been settled the regular services will be resumed as soon as possible and by the end of the present week should be in full working order.

Northern Air Lines.

The Belfast to Liverpool air-mail service was inaugurated on May 1. The administration of this concern is in the hands of Mr. D. M. Greig and the agents are Eason and Son (Belfast) Ltd., of 17, Donegall Street, Belfast. The passenger fare between Belfast and Liverpool has been fixed at £3 including 30 lbs. for luggage and excess luggage at 3d. per lb. extra.

At present the line is not dealing with parcels as the expense of delivery would not make parcels traffic practicable. It is hoped that arrangements will be made however through the Post Office to deal with parcels shortly. The aerodrome is so close to the city that it is not necessary to run a car to take passengers from the city to the ground but passengers will be met at Aintree and conveyed to Liverpool.

The weather during the first few days of the service was about the worst ever experienced at this time of the year which was somewhat unfortunate. But there is little doubt that the service will be a success. Mr. Alan Cobham and Mr. V. N. Dickinson are operating the service with two D.H.50s.

The Lord Mayor of Belfast made the first trip in very bad weather on May 1. He was met at Liverpool by the Lord Mayor of that city and in a short speech he said that this was a red-letter day and would shortly be "read" letter day for Liverpool as letters written in Belfast and sent by air mail would in future be read the same day in Liverpool. [Respectful laughter, presumably.—ED.]

On the trip from Liverpool to Belfast there will be no passenger accommodation as space in the machine has already been booked up for six months. Details of this service will be given in THE AEROPLANE weekly.

The Berkshire Aviation Tours.

The Berkshire Aviation Tours has already started the season's work under the guidance of Mr. F. J. V. Holmes. Messrs. Sparkes and Parkinson are still flying for the firm and a new pilot, Mr. C. S. Kent, has now joined them. The latter is flying the five-seater Avro with a 130 h.p. Clergêt.

Mr. Sparkes has been flying at Falmouth where he took up 290 passengers during Easter. Messrs. Parkinson and Kent have been at Swindon where they took up over 500 passengers. A total of 790 passengers in one week at this time of the year seems to be very good going.

The five-seater behaves very well and gets off with a full load very much like an ordinary Avro.

The Tour will visit Bristol next and then they start a Cornish Tour going to Helston for the Floral Dance.

The firm seems to be exceptionally fortunate in its selection of ground engineers all of whom work together with a will. None of them is really happy unless there is plenty of hard work to do. Besides those on tour there are three more working at G.H.Q., East Hannay, where they are entirely on their own responsibility. Here the output is equally wonderful and the machines are a great credit to all concerned.

Mr. Butler's Tour.

Mr. Alan Butler who is engaged on a business and pleasure tour of Europe with the D.H.37 (Rolls-Royce Falcon) left Nice at 11.30 hrs. on May 1 and arrived at Milan at 13.15 hrs. He left Milan at 15.45 hrs. and arrived at Venice at 17.00 hrs. His comment is "Italians very kind engine going fine." Here he spent Friday and Saturday night thereby disproving the modern theory that when it's night time in Italy it is necessarily Wednesday over here.

On May 3 he left for Zagreb in the North-West of Jugo-Slavia. He reached there in two hours after a landing at Gorz owing to slight engine trouble. On landing at Zagreb a tyre burst owing to what Mr. Butler describes as a bad landing.

THE GLOBE TROTTERS.

THE BRITISH TEAM.

A new low-compression Napier engine was despatched on May 1 from England to Karachi for Sq. Ldr. MacLaren. This is due to reach Karachi on May 17. A high-compression engine has been sent from the R.A.F. at Baghdad and this was due at Karachi on May 6 and at Parlu to-day May 7.

If Mr. MacLaren decides to fit the high-compression engine he should resume his flight tomorrow, May 8. If he waits for the low-compression engine he should restart on May 19.

THE AMERICAN EXPEDITION.

On Apr. 26 Major Martin who had been held up at Kanatak Head owing to engine trouble necessitating the installation of a new engine left for Chignik where he arrived the same day. On Apr. 30 he left Chignik for Dutch Harbour to rejoin the rest of the expedition who had been instructed to await his arrival before continuing the flight, but since then nothing has been heard of him.

On May 1 all available vessels were instructed to search for the machine and its crew, hope being entertained that he had sought refuge in one of the numerous bays or inlets on the desolate Alaskan coast.

On May 2 Lieut. Lowell H. Smith received instructions from the chief of the U.S. Air Service to proceed on the flight with three machines as soon as the weather permitted.

Meanwhile the search for Major Martin has been carried on both by every available ship and also by dog-teams on land but up to the present no trace has been found of the missing officer and mechanic and their machine.

On May 3 the three machines under the command of Lieut. L. H. Smith left Dutch Harbour, where they have been waiting since Major Martin's first mishap, for Atka Island, one of the Aleutian Islands, and arrived the same day.

The Paris-Tokio Flight.

As reported in last week's THE AEROPLANE Lieut. Pelletier d'Oisy who is attempting to fly from Paris to Tokio on a Breguet XIX A2 biplane (400 h.p. Lorraine-de Diétrich engine) reached Bandar Abbas on Apr. 28 at 08.00 hrs. having left Paris on April 24 at 06.15 hrs.

On Apr. 30 the French Department received the following telegram from Lieut. Pelletier d'Oisy:—

> "Left Bandar Abbas at 06.15 hrs. and landed at 13.30 hrs. at Drigh Road aerodrome, Karachi (British India). On taking off at Bandar Abbas a tyre burst In spite of this a good landing was made at Karachi. The flight over Baluchistan was difficult over mountainous and barren country."

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The flight from Bandar Abbas to Karachi, 1,250 kms. (781 miles), took 7 hrs. 15 mins.

The flight from Paris to Karachi took 5½ days or 38 hours' flying time.

On May 3 Lieut. Pelletier d'Oisy sent the following message to the Department of Military Aeronautics on arrival at Agra :—

> I arrived at Agra in very hot weather. Leaving Karachi at 6.45 a.m. I landed at the Agra aerodrome at 1.30 p.m., having covered the distance of 800 miles in six and three-quarter hours. I was much shaken by gusts of hot wind during the journey, in the course of which I passed the aeroplane of Squadron-Leader Maclaren, stopped at Parlu owing to a breakdown. On landing I found that owing to the heat the fabric on the upper plane of my machine was beginning to strip off. I do not yet know whether I shall be able to continue my journey towards Calcutta to-morrow, but I hope to do so.

Lieut. Pelletier d'Oisy arrived at Dum-Dum aerodrome, Calcutta, at 13.00 hrs. on May 5 from Agra, a distance of 750 miles in 6½ hours. The actual time of his departure from Calcutta is doubtful as the condition of the fabric on the upper plane, which was reported to be damaged at Karachi, has been gradually getting worse, and it will be necessary for repairs to be made before proceeding any further.

The actual flying time from Villacoublay to Calcutta is 51½ hours, which shows what a properly organised air mail line could do.

The Lisbon-Macao Flight.

Capt. Brito Paia and Lieut. Sarmento Beires of the Portuguese Army, who left Amadora near Lisbon on Apr. 2, in an attempt to fly from Lisbon to Macao in China on the Breguet Biplane "Patria" (300 h.p. Renault engine) arrived at Bushire on Apr. 30 where they were detained for a few days by the Persian authorities owing to their papers not being in order.

On May 3 at 11.15 hours they arrived at Charbar and left there at 07.45 hours the following day for Bandar Abbas where they arrived at 13.05 hours.

The Breguet biplane "Patria" arrived at Karachi on May 4 after having flown through dust storms combined with hot land breezes off the Baluchistan coast which impeded progress and proved to be very exhausting for the crew.

On May 5 the local Goanese community were to present an address of welcome to the first Portuguese pilots to fly to India.

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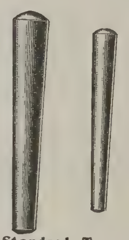

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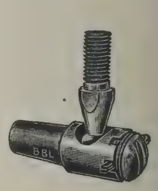

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INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

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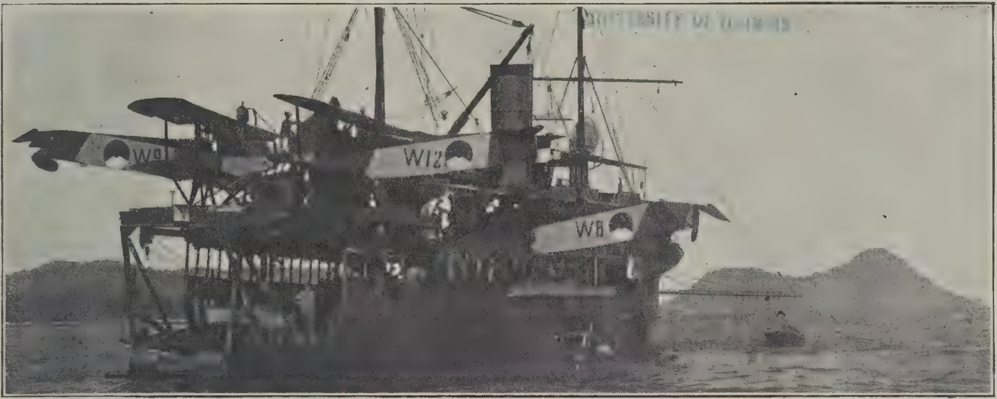

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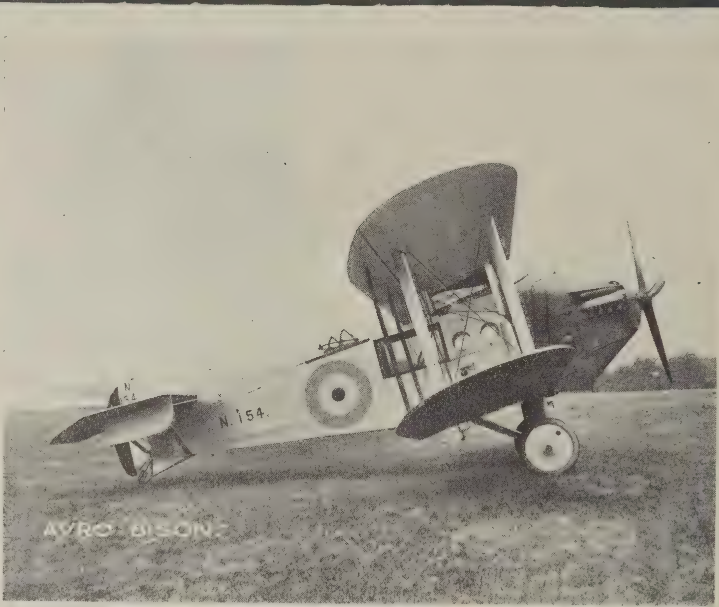

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ON A LESSON IN SPEED.

The wonderful flight made by Lieut. Pelletier d'Oisy of the French Service d'Aviation Militaire from Paris to Calcutta ought to provide a useful text for all those who are concerned with and for the progress of British Aviation. M. d'Oisy's actual flying time from Paris to Calcutta was 51½ hours, that is to say just 3½ hours over two days. He flew a perfectly standard French Army machine taken as it stood with its own engine out of the equipment of his escadrille. The machine and engine alike are ordinary series products and were in no way specially built or faked for the occasion.

The machine is an ordinary two-seater Breguet biplane and the engine is a standard Lorraine-Diétrich of 350 or 400 h.p. With that engine the machine is designed to carry 800 kilogrammes (1,800 lbs.) of bombs. With that load the speed of the machine is over 140 m.p.h., which is very little below the top speed of the best English single-seat fighters.

This superiority of performance over the performance of any British aeroplane of approximately the same power and carrying approximately the same load is not due to any lack of intelligence on the part of British designers but purely due to the superior intelligence of the Technical Section of the French Service d'Aviation as compared with the technical people at the Air Ministry whose continual interference with designs produced by men of mental ability vastly superior to their own has during the two or three years reduced the performance of British aeroplanes to the third or fourth class.

This lamentable position will doubtless be rectified in due course when sufficient agitation has taken place and when the Air Staff has realised that the Royal Air Force is being let down as a fighting force by its technical subordinates and possibly when the new Director of Technical Research has settled down to work and has cleared out the majority of the people who have mishandled technical affairs.

Purely incidental and as a hint to the new broom in his spring cleaning one would hazard the opinion that quite half the trouble in the Technical Department is caused by people with no practical experience of aircraft building but with quite considerable ability in the way of making jobs for themselves by the multiplication of documentary detail work.

Thus the voyage of M. d'Oisy may be of very high value to the Royal Air Force. And if the people on whom the immediate progress of Civil Aviation depends will learn their lesson it may be found that the voyage is quite as valuable to Civil Aviation. If the Directors of Imperial Airways Ltd. would take the risk of building a dozen machines with a performance equal to that of the Breguet XIX A2 and would run a regular mail service with them to Calcutta in good weather and to Karachi during the Monsoon season they would go far to prove the real value of civil aviation.

It must be remembered that M. d'Oisy with his long voyage in front of him was deliberately running his engine at cruising speed. Consequently a properly organised air line on which the mails were run by relays of machines in stages of not more than 250 miles could quite easily cut the mail time from London to Calcutta down to the level 48 hours. That is to say a letter posted on Monday morning in London would be delivered in Calcutta on Wednesday morning.

With proper machines and the proper organisation there should be no difficulty at all in running such a relay service at night, when as a matter of fact the weather is as a rule better for flying than it is in the daytime. And it may be noted incidentally that the route taken by M. d'Oisy round the North of Switzerland to Constantinople and across Anatolia is very nearly the route which has consistently been advocated in THE AEROPLANE as the proper mail route to India instead of going all the way round by Egypt.

For an experimental air line there is actually no need for machines of even the comparatively low power of M. d'Oisy's Breguet. It is unlikely that machines would have to carry 1,400 lbs. of mail matter, at any rate at first. It would probably be very much better to build comparatively small light single-seaters with low-powered cheap engines such as the old reliable Siddeley Puma which can be bought by the thousand from the Aircraft Disposal Company. Such a machine could well carry 200 lbs. of mail matter and travel very much faster than did M. d'Oisy's machine.

In any case one hopes that the article by Captain Sayers which appears elsewhere in this issue will enlighten the Air Staff as to the damage which has already been done by the busy-bodies of the Technical Department. And one would direct particular attention to the humiliating fact disclosed in the article that we *may* have in service in the course of the next year or two a few single-seaters which would be just capable of catching M. d'Oisy's machine when equipped as a fighter and not as a bomber. The table which is appended to the article is the most depressing form-at-a-glance publication that one has seen for many years.—C. G. G.

ON IMPERIAL AIRWAYS.

Elsewhere in this issue there will be found a complete schedule of the air lines which Imperial Airways Ltd. hope to have in full operation during the next few weeks. It will be seen that these include the old-established routes, London-Paris, London-Cologne, London-Berlin (via Amsterdam), and Southampton-Guernsey. When these are fully organised and adequately equipped with signal stations and wireless controls it will be time enough to think of extending the lines to other parts of the British Empire so that the firm may fulfil the excellent intentions implicit in its name.

The task before the directors and the management is difficult. They have first to prove that flying is safe, then they have to convince the travelling public that flying is worth while, and after that they have to bring the price of the fares down to something rather less than double those of the rail and steam-boat services. It is fairly evident that none of the existing machines can be held up as being as safe as aeroplanes can be made to-day. And it is perfectly certain that they cannot be run as a commercial proposition at the present fares, let alone at something like half those fares. It would seem therefore that the first work of the directors should be to search among the aircraft constructing firms for entirely new designs for aeroplanes which shall be both safe and economical.

In the meantime—pending the production of such machines—the fact that flying is worth while can be demonstrated by a skilfully conducted publicity campaign devised to show the public how much time can be saved by air transport and how regularly aeroplanes can run to schedule. Thus the future air-traveller can be educated so that by the time the new machines are ready there may be people ready to use them. Until then Imperial Airways Ltd. must be regarded as a propagandist rather than a commercial concern. But there is always the consoling fact that the management of the firm is in the hands of experienced business men who have proved in the past that they are capable of taking hold of a thoroughly unpromising proposition and of turning it into a profit-making business. One wishes the same success to Imperial Airways, Ltd. as has attended the London General Omnibus Company and the Daimler Hire Service, two transport undertakings which are in their essentials, especially in the problems which had to be solved at their beginnings, very similar to our new air lines.—C. G. G.

* * *

THE ACADEMY BANQUET.

At the annual banquet of the Royal Academy which was held on May 3 at Burlington House, in reply to the toast of "The Imperial Forces of the Crown" the Lord Thomson replying for the R.A.F. mentioned that his first official connection with flying was somewhat less than 20 years ago, when as an Engineer officer he sat upon a committee assembled to investigate Cody's man-lifting kites. One branch of the activities of the R.A.F. was sometimes overlooked. He referred to that which included in its activities overseas those great regions, some of which were called mandated areas, over which the Air Force maintained law and order and the supremacy of the British flag. He believed that in those vast tracts of land where the peoples were backward and which the British had to police and administer they could appeal to the imagination of those peoples by superior civilisation, and rule them rather by wonder than by force and fear. At any rate, the Air Force in the regions of which he had spoken exercised a potent influence, saved the nation great sums of money, and did "deliver the goods."

THE WEST FRONT IN THE NEXT WAR.—IV.

By C. G. GREY.

Home Defence in Practice.

Having discussed Active Defence and Passive Defence as matters of policy it is now necessary to consider them as practical propositions. In the debates in the House of Commons and in the House of Lords the question has constantly been raised as to what is "adequate defence." It is a difficult question to answer. But it is at any rate evident that an air force equal in strength to the nearest air force within striking distance is not adequate. For if the country which has an equally big air force acquires an ally who has an air force of any sort then the defence force becomes inadequate. And here it should be noted that being equal in strength is not at all the same thing as being equal in size.

Therefore it is clear that what is called a "One Power Standard" is inadequate. And if we build an air force equal to the sum of the two next strongest we may still be overwhelmed by a triple alliance. Consequently one disbelieves in any scheme of building to a power standard.

One submits, with all due respect to our Service and Political chiefs that the way to build up an air force, or any other fighting service, is to make up one's mind as to where the next war is going to be and build for that. Which is exactly what we did *not* do before the War 1914-18.

Five or ten years before 1914 we knew we were going to fight Germany and we knew the position of our Expeditionary Force on the left flank of the French Army. But although we knew that the Germans were buying machine-guns by the tens of thousands from England, we did not equip our troops on a corresponding scale—which was the fault of the Treasury and not of the War Office. On the other hand the War Office did organise its transport and troop movements so that the British Expeditionary Force arrived in its appointed place in time and in perfect order.

And although we knew that the German Navy was building submarines in quantities out of proportion to her big ships the Admiralty made no special preparations to fight submarines by sea or air. Instead the Navy kept on building white elephants. And though a white elephant (in the shape of a big ship) may be useful as a fetish in a superstitious Service it is easy to over-produce the species. But that is only what was to be expected from an Admiralty which did not even possess a War Staff.

Now, when we come to argue about building an adequate air force for Home Defence to-day, we have to consider where and against whom we are going to use it. And the types of aircraft required have to be considered.

The Civil Aviation Fallacy.

There are probably quite a number of people who, thanks to the well-meaning propagandist efforts of writers like Admiral Mark Kerr and Brig.-General P. R. C. Groves with their everlasting sermons about Civil Aviation being the reservoir from which our Air Force must draw its supplies, visualise the outbreak of the next war as a raid on Paris executed by Daimler and Handley Page and Instone airliners with their cabins full of bombs, which will presumably be shovelled overboard by the cabin-boys.

One uses the old air-line names because they conjure up visions of certain distinct types of machines and of different methods of running them. By the time the war does come a few years hence it is possible that the Board of Imperial Airways Ltd. may have hardened its heart to be firm in the matter of engaging pilots for itself instead of letting pilots hold up its operations till they are graciously pleased to accept engagement, and so it may have several obedient pilots at its disposal. Also it may have brought its mind up-to-date and may have scrapped all the types of aeroplanes which it has inherited from its forerunners and may have acquired an outfit of modern multi-engined machines which can keep on flying if an engine fails and can alight slowly if another engine or two ceases work. At the moment the big strong men of Imperial Airways Ltd. are not shaping in that direction, or in any particular direction. But one has hopes of them.

That, however, is rather by the way. The point is that a good many people who have only a limited knowledge of active-service aviation and less still of aeroplane design insist on thinking and on trying to make other people think that civilian aeroplanes are going to be useful in the next war as actual weapons of war. Therefore it is just as well to begin by disposing of that fallacy.

A False Analogy.

Those who preach this heresy insist on quoting the fact that the portion of the British Navy which did the most active service in the War 1914-18 was composed almost entirely of men from the Mercantile Marine and that a majority of its ships and officers were also merchantmen. Which is quite true.

Barring the destroyers and submarines the regular Navy saw little fighting. The mine-sweepers were all civilian ships with entirely civilian crews. The anti-submarine patrols were mostly merchant ships with crews from the Royal Naval Reserve and the Royal Naval Volunteer Reserve. The officers and men of destroyers and cruisers used for escorting convoys were chiefly R.N.R. and R.N.V.R. And the big ocean-liners used as auxiliary cruisers and troop-ships and hospital ships and transports were manned by people who in time of peace had handled such ships, though frequently they were commanded with lamentable effect by regular or dug-out Naval Officers.

The reason for this was simply that the British Mercantile Marine was many times as big as the Royal Navy. One does not know the figures, but at a guess one would say that there were a hundred merchant sailormen for every one in the Navy.

The officers and men of the R.N. were needed to work the complicated machinery of the big war-ships on which they had been trained. They could not be spared for the irregular warfare of the high seas and of coast patrols and of convoy work, because they were needed for the Grand Fleet, which, though it saw hardly any fighting, had to be maintained in its integrity awaiting the time when the German Fleet should come out and fight. This was hard luck on the regular R.N., who were at any rate good fighters even though their chiefs on shore and many of their senior officers afloat were not brilliant nor even intelligent war-makers.

Naturally therefore the bulk of the sea work was done by the civilian seafarers, who made up in rough and tumble knowledge of the sea and its evil ways for their lack of discipline and their neglect of Service methods. In all probability they were better suited to their own guerilla fighting than R.N. personnel would have been. And it is just because they were successful in their own comic way that the argument in favour of Civil Aviation being a reservoir for the R.A.F. sounds so plausible.

Reservoir or Sump.

As a matter of fact the situation in Aviation is just exactly the other way round. Instead of Civil Aviation being the reservoir pure and undefiled which will supply the Air Force the truth is that Civil Aviation must be for many years to come the sink or drain which absorbs the residue from the Air Force.

One does not say this in any uncomplimentary spirit to civilian aviators, one merely extends the simile originated by those unduly enthusiastic advocates of Civil Aviation.

In the first place, if Civil Aviation is to be a success it must be run efficiently as a business proposition. Which means that for a given number of miles flown and for a given number of machines used it must employ a smaller number of people than the Air Force, in which economy and efficiency are not matters of mileage per pilot or of miles per machine. People forget that a fighting Service is a spending organisation and not an earning organisation and that it measures economy and efficiency in such ways as by hits per hundred bombs dropped or by hits per thousand rounds fired or by photographs per hundred exposures.

Now the personnel of the R.A.F. consists of some 3,000 officers and 30,000 men. And Civil Aviation, according to the Pilots' Federation, consists of 24 (a whole two-dozen) pilots and presumably about 240 mechanics, if as many. Before Civil Aviation can be of any use as a reservoir to the R.A.F. it is fairly obvious that it must grow to such an extent as to employ at least 30,000 pilots and 300,000 men—for a 10 to 1 ratio of supply does not seem excessive. It would be a poor bottle that did not hold ten drinks.

Supply and Demand.

Considering that sixteen pilots were enough to run the London-Paris, London-Cologne and London-Berlin air services in 1923, it is not difficult to understand that some few years must elapse before Civil Aviation can possibly employ 3,000 pilots, let alone 30,000. Moreover as several hundred R.A.F. pilots with expired Short Service Commissions will be passing out of the Air Force into the Reserve each year in future it is fairly evident that as more pilots are needed for Civil Aviation the managers of air lines and air survey squadrons and so forth will engage pilots fresh from the R.A.F. with all the latest technical knowledge in their possession rather than go to the expense of training civilian pilots of their own. In fact jobs as pilots or technical officials in Civil Aviation are about the only hope of the Short Service officers in the R.A.F.

Therefore it follows that for very many years to come the R.A.F. will be the reservoir which will supply Civil Aviation,

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Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Británicos.

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéreos.

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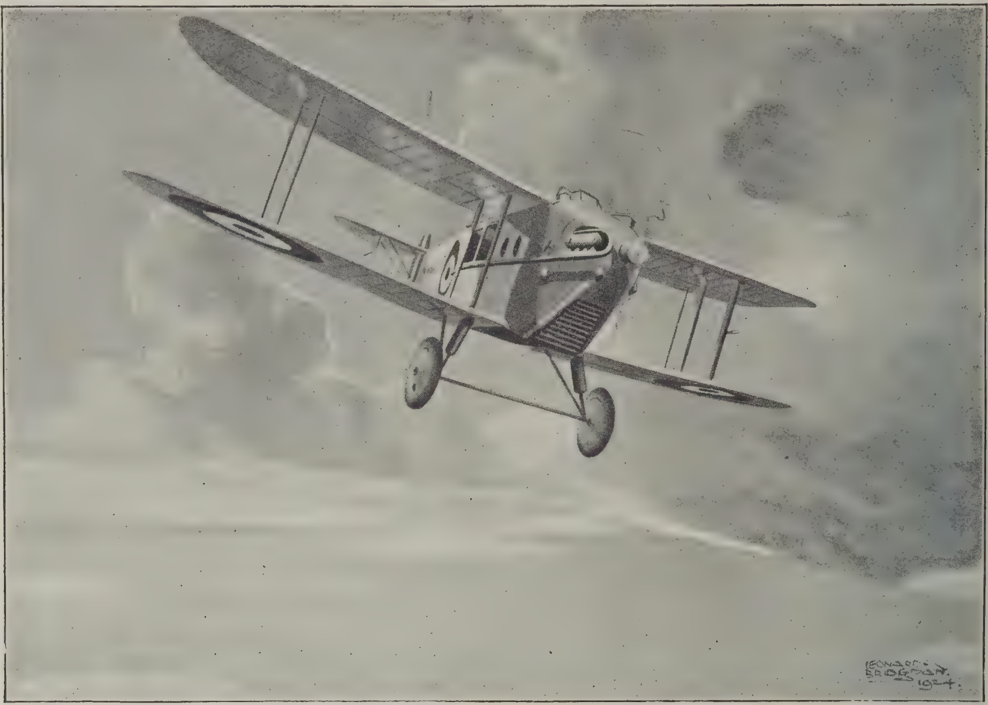

HASTENING.—An impression by Mr. Leonard Bridgman of the Avro Bison (Napier) Fleet-spotter. It is one of the numerous machines built for the Fleet Air Arm and it is probable that at times of emergency naval officers will send for it in a hurry.

Or to put it another way, Civil Aviation will be the sump which will receive the overflow from the R.A.F. and will store it ready to be pumped back into the R.A.F. in time of war. And if by any remote chance there should be no war for the next few years one would estimate that it must be 25 or 30 years before Civil Aviation grows to such an extent as to have to train civilian pilots and mechanics instead of filling its needs with time-expired and experienced personnel of the R.A.F.

Over and above that there is the fact that when air lines are properly developed and equipped with signalling apparatus the regular air line pilot must of necessity possess the temperament of an engine-driver and so will be of very little use in war except in so far as his particular air line becomes a line of communication or of troop-transport. The air-taxi drivers and the air survey pilots, being used to flying anywhere and everywhere, will be of general use in bombing and reconnaissance machines. But not so the air-line bus-drivers.

War Craft and Commercial Craft.

There is also the question of the use of commercial aeroplanes in case of war. The modern passenger-carrier looks so nearly like a war machine that there is some excuse for the ignorant to imagine that either can be used for the other's purpose. Much in the same way an ignorant landsman might imagine that because every ship has a sharp end and a blunt end any ship can do the job of any other ship of the same size and that because she is bigger the *Mauretania* could do the same work as the *Queen Elizabeth* and do it better or do more of it.

It so happens that the designs of aircraft-of-war are diverging more and more from the designs of commercial machines. Speed and climb and manœuvrability are more important in war craft. Reliability, durability and ease of control are more important in commercial craft. War machines must contain the maximum of destructive power in the minimum of space. (It will be a few years yet before the Air Force awakes to the fact that the colossal bombers which it is building to-day are a waste of time and money and material.) Passenger and goods machines must provide plenty of room for a heavy load of light substances, for even the fattest man is considerably lighter than a bomb of the same bulk.

Therefore it may be taken as an axiom in considering the next war that Civil Aviation is going to be of very little use to the Air Force, firstly because there will not be enough men or machines to provide any considerable addition to the strength of the R.A.F. and secondly because, with a few exceptions, the personnel and matériel of Civil Aviation will be unsuitable for use on active service. That being so, it is well to leave Civil Aviation out of our calculations when discussing our strength in the air.

It should be noted that all the foregoing arguments concerning the air strength of Great Britain apply equally well to all foreign countries. France has been running air lines of considerable extent, though on the whole with less efficiency than our own. In the United States the trans-Continental air mail service has been run effectively but extravagantly with hopelessly obsolete and inefficient machines. Germany has run numerous air lines with great regularity in spite of the antiquated aircraft enforced by the Commission Aéronautique Interalliée. And it may be taken for granted that though all this air work has been useful as a means of popularising the idea of flying it has been almost useless considered as an aid to future war.

(To be continued.)

The Coupe Beaumont.

The entries for the competition for the Coupe Beaumont which will take place at Istres aerodrome near Marseilles on June 22 are as follows :—

1. *Société des Moteurs Salmson.*—Salmson-Béchereau monoplane (500 h.p. Salmson engine).
2. *Société Nieuport-Astra.*—Nieuport-Delage sesquiplan No. 2 (450 h.p. Hispano-Suiza engine).
3. *Société Nieuport-Astra.*—Nieuport-Delage sesquiplan (300 h.p. Hispano-Suiza engine).
4. *Société Industrielle des Métaux et du Bois "Ferbois"* (S.I.M.B.).—Ferbois racing monoplane, type 5 (450 h.p. Lorraine-Diétrich engine).
5. *Gloucestershire Aircraft Co., Ltd.*—Racing biplane (450 h.p. Napier Lion).

The Nieuport-Delage pilots will be MM. Sadi Lecointe and Lasne, and the new racing Gloucestershire machine will be piloted by Mr. Larry Carter. The other pilots have not yet been chosen.

Sir W. G.

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THE ROYAL AIR FORCE.

The London Gazette.

May 6.

Air Commodore F. C. Halahan, C.M.G., C.B.E., D.S.O., M.V.O., is appointed Director of Technical Development, Air Ministry (Apr. 18).

General Duties Branch.—The follg. Plt. Offs. on probation are confirmed in rank (Mar. 15):—C. G. M. Anderson, E. L. Batson-James, C. H. W. Boldero, J. S. Branch, D. C. Burnley, E. C. Dearth, G. D. Gibson, R. P. Keely, L. C. Lewis, K. Maconochie, D. J. F. McMillan, C D. S. I. McDeivitte, C. H. P. Morgan, T. de L. Neill, R. F. de R. Read, L H. Ross, L. R. Shaw, S. M. Thomas, J. B. Townend, F W. C. G. Tussaud, J. H. Woodin.

Flg. Off. C. T. Johnson relinquishes the acting rank of Flt. Lt. (Nov. 21, 1921); Plt. Off. C. M. O. O. Springfield is placed on the retired list on account of ill-health (May 7). The follg. relinquish their S.S. commns. on account of ill-health (May 7):—Flg. Off. R. E. Bright, Plt. Off. N. P. C. Mellor

Stores Branch.—The follg. are granted S.S commns. as Plt. Offs. on probation for accountant duties, with effect from, and with seny. of Apr. 28:—W. F. Barreli, F. L. Brown (Capt., Indian Army, retd.), D F. A. Clarke, J. M. Hopkins, G. R. Keep (Capt. R. of O., R. Sussex Regt,), S. C. Wyatt (Paymr. Lt, R.N., retd.). Plt. Off. on probation C W. Cackett is confirmed in rank and is promoted to rank of Flg. Off. (Dec. 5, 1923).

Medical Branch.—G. P. O'Connell, M. B., is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, Apr. 23); Flt. Lt. (Hon. Sq. Ldr.) H. B. B. Greene relinquishes his temp. commn. on ceasing to be empld., and is permitted to retain rank of Flt. Lt. (Apr. 14); the notification in *Gazette* of Apr. 29, 1924, concerning Flg. Off. K. R. Smith, M.D., D.P.H., is cancelled.

Princess Mary's Royal Air Force Nursing Service.—Miss M. E. Garnett is confirmed in her appointment as Staff Nurse (Dec. 15, 1922).

Memoranda.—Maj.-Gen. Sir H. H. Tudor, K.C.B., C.M.G., relinquishes his temp. commn. as an Air Vice-Marshal on ceasing to be employed (Apr. 26).

May 9.

General Duties Branch.—Flg. Off. D. K. Whitlock is cashiered by sentence of General Court-Martial (Jan. 20). [The name of Douglas K. Whitlock appears in the Air Force List as being on Intelligence duties, H.Q., Iraq Command.—Ed The Aeroplane.]

Appointments.

Week ending May 12.

General Duties Branch.—Air Commodore R. H. Clark-Hall, C.M.G., D.S.O., to Egyptian Group H.Q., pending taking over command, 2/5.

Wing Commanders J. H Tyssen, M. C., to No. 1 Group H.Q., Kidbrooke, for Air Staff Duties, 19/5; T. G. Hetherington, C.B.E., to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab., 20/4.

Squadron Leaders H. A. Mitchell, O.B.E., to H. Q., Palestine, 15/4; F. P. Don, to H.Q., Egypt, 11/4; W. H. de W. Waller, A.F.C., to No. 4 F.T.S., Egypt, 9/4; D. Iron, O.B.E., to No. 2 F.T.S., Duxford, 23/5; F E. Hellyer, O.B.E., to No. 1 Group H.Q., Kidbrooke, 19/5; Hon. L. J. E. Twisleton-Wykeham-Fiennes, to No. 29 Sqdn., Duxford, 1/6; G H. Bowman, D.S.O., M.C., D.F.C., to R.A.F. Depot whilst attending course at Senior Officers School, Sheerness, on transfer to Home Estab., 23/5; C. C. Durston, to No 13 Sqdn., Andover, 30/5; A. W. F. Glenny M.C., D.F.C., to School of Army Co-operation, Old Sarum, 30/5; A. A. Walsher, M.C., D.F.C., to No. 31 Sqdn., India 2/5; A. N. Gallehawk, A.F.C., to Transjordania H.Q., Palestine, 2/5.

Flight Lieutenants D. V Carnegie, A.F.C., to R.A.F. Depot on transfer to Home Estab., 28/4; H. W. Woollett, D.S.O, M.C., to No. 4 F.T.S., Egypt, 16/4; H. V. German, to Basrah Group H.Q., Iraq, 1/4; A. J. Osborn, to No. 20 Sqdn., India, 3/4; M. Moore, to R.A.F. Depot, on transfer to Home Estab., 21/4; J. J Williamson, A.F.C., to No. 70 Sqdn., Iraq, 11/4; J. Cottle, M.B.E., D.F.C., to H.Q., Iraq, 7/4; G. C. Anne, O.B.E., to R.A.F. Depot, 12/5; A. H. Pearce, D.F.C., to Air Ministry, 12/5; A. L. Fiddament, D.F.C., to No. 100 Sqdn., Spittlegate, 27/5; S. D. Culley, D.S.O., to No. 2 Sqdn, Manston, 22/5; C. M. Laing, M.C., A.F.C., to No. 7 Sqdn., Bircham Newton, 20/5.

Flying Officers W. J. Richards, to No 6 Group H.Q., Kenley, 19/5; G. A. Kysh, to School of T.T. (Men), Manston, 27/5; J. D. S. Denholm to remain at Armoured Car Wing H.Q., Iraq; S. A. Lane, to No. 5 Arm. Car Coy., Iraq, 14/4; C. Jackson, to H.Q.I.A., 2/5; A. Sattin, to C. & M. Party, Donibristle, 30/4; L. J. Booth, to R.A.F. Base, Leuchars (No. 44 Flt.), 19/5; R. L. Bateman, to R.A.F. Base, Leuchars, 12/5; F. J. E. Feeny, to Basrah Group H.Q., Iraq, 20/4; J. Sutherland, M.B.E., to Air Ministry, 2/6; M. W. J. Boxall, to remain at No. 7 Sqdn., Bircham Newton, instead of to No. 9 Sqdn.

Pilot Officer C. F. Roupell, to No. 9 Sqdn., Manston, 15/5.

Medical Branch.—Flight Lieutenants (Medical) C. P. Barber, to No. 27 Sqdn., India, 28/3; C. A. Lindup, to No 5 Sqdn., India, 7/4.

Legal Branch.—Wing Commander S. C. R. Crawford, O.B.E., T.D., to Air Ministry for duty in Judge Advocate-General's Office, 10/4.

Stores Branch.—Squadron Leader (Accountant) J. Rylands, to No. 4 Stores, Ruislip, 1/6. Flight Lieutenants (Stores) A. Jukes, M.B.E., to No. 1 Group H.Q., Kidbrooke, 19/5; M. J. James, M.B.E., to No. 6 Group H.Q., Kenley, 1/6; H. E. T. Crocker, to R.A.F. Depot on transfer to Home Estab., 25/4; F. Paterson, to R.A.F. Base, Calshot, 30/4. Flight Lieut. (Accountant) P. Hay, M.C., to H.Q. Accountant Office, Iraq, 6/4. Flying Officers (Stores) H. J. Bamber, to Aircraft Park, India, instead of to Aircraft Depot as previously notified; L. A. Mudge, to C & M. Party, Isle of Grain, 15/4; R. V. Robinson, to Supply Services, Iraq, 22/4; A. Davidson, M.C., to Supply Services, Iraq, 2/5. Flying Officer (Accountant) J. J. T. Rose, to H.Q., Egypt, 2/5.

The Cabinet and Airships.

Various papers stated on May 13 that the Secretary of State for Air will make a statement in the House of Lords on Thursday in reply to a question by Lord Gorell on the subject of the Government's airship policy. The Cabinet has come to a decision with respect to the building of airships, and this will be the first official announcement of Ministerial policy. It is understood that the Burney Airship scheme is involved in the statement, and that Air Ministry co-operation with Commander Burney's scheme will be announced.

The Interpretation of Aerial Photographs.

The Times of May 7 states :—

A series of ten courses in the interpretation of aerial photographs will be held at the R.A.F. School of Photography, Farnborough, for Army and R.A.F. officers. The object of the courses is to train one officer in each regiment of cavalry, brigade of artillery, divisional engineers, battalion of infantry, and tank battalion of the Regular Army to a standard which will enable him to act as an instructor to his unit. Vacancies will be allotted to commands at home in proportion to the number of regular units in each. It is intended that only one officer from each station abroad shall be trained at Farnborough, and that, on his return to his station, he shall hold local courses for the training of officers from all other units in the station.

Trawler Spotting.

The Morning Post of May 9 states :—

At Portree, Isle of Skye, George Scivwright, trawlmaster, of Aberdeen, was found guilty of fishing within territorial waters in the Inner Sound at Raasay, and was fined £200. It was stated that defendant was detected by a seaplane acting independently of the patrolling cruiser. Lawbreaking trawlers have now to reckon with seaplanes as scouts in western waters.

A General Court Martial.

The *Morning Post* of Apr. 16 states :—

A General Court-martial sat at Farnborough to try Flg. Off. J. E. V. Lindsay, No. 4 Sqdn., R.A.F., on a charge of flying a machine without permission.

According to the evidence, defendant was on Mar 13 ordered to accompany Plt. Off. Nuttall to Netheravon in a Bristol machine as a passenger. They arrived safely, and while the pilot was away from the aerodrome defendant took the machine up for a flight. In landing he met with an accident, which damaged the machine Evidence was called to prove that defendant was a fully qualified and experienced pilot, and had flown the same machine many times.

The Court's finding will be promulgated later.

The Silent Service.

The *Times* of Apr. 24 says :—

Commander E. K. Boddam-Whetham, D.S.O., who has been selected to join the aircraft-carrier "Argus" for observer duties, is at present studying at the Royal Air Force Staff College at Andover, to which he was appointed a year ago. He formerly served in the "Argus," to which he was appointed in July, 1922, as a probationary observer. In 1918-20, prior to his promotion, he commanded the destroyer "Swallow" in the Mediterranean.

The current Navy List shows that there are already 11 lieutenant-commanders and lieutenants in the "Argus" for observer duties; six in the "Eagle"; and two in the "Pegasus." These are additional to any R.A.F. officers serving afloat.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

CRANWELL BOXING.

The Boys' Wing Boxing Championships were held on Apr. 11 in the Wing Gymnasium before a gathering which included Air Commodore C A. H. Longcroft and Air Commodore A. E. Borton. Some excellent contents were witnessed, the results being as follows :—

Heavyweights:—Messenger (No. 2) beat Lund (No. 1) in a hard hitting contest in which the winner took full advantage of his superior reach.

Light Heavyweights:—Mutch (No. 3) beat Richardson (No. 1) after an extra round Handicapped by a broken nose the loser fought gamely and was awarded the good losers medal

Middleweights:—Bailey (No. 2) further enhanced his reputation by beating Dukes (No. 3), the referee stopping the fight in the last round.

Welterweights:—Simpson (No. 3) beat Sharpe (No. 1) on points without difficulty.

Lightweights:—Smith (No 1) beat Boulton (No. 3) after a close fight.

Featherweights:—Love (No. 3) beat East (No. 3) on points.

Bantamweights:—Greenwood (No. 1) beat Wareham (No. 2), the referee stopping the fight in the second round. Greenwood was more experienced than his opponent and had the fight well in hand within the first minute.

Flyweights:—Lamey (No 3) gained a popular victory in beating Boyd (No. 2). The loser was the more experienced boxer but Lamey made up for this by his hard hitting

Paperweights:—Oatey (No. 3) beat Kean (No. 2) both competitors putting up an excellent show.

The Inter-Squadron Trophy was won by No. 3 Squadron with 72 points, No. 1 being the runners up.

The medals were presented by Air Commodore A. E. Borton, C.B. who complimented the September, 1923, entry on winning five out of the nine championships. A total of no fewer than 514 apprentices have fought during these competitions.

Athletics.

Cranwell v. Woolwich :—The annual athletic match between the Royal Military Academy and the R.A.F. Cadet College took place on April 6. Woolwich won seven events and Cranwell two. Cranwell were not placed in the High Jump, the Two Miles, the 120 Yards Hurdles and the One Mile. The results of the other events were as follows :—

100 YARDS.—W. H. Collins (Wellington and Woolwich), 1; P. R. G. Bernard (Wellington and Cranwell), 2. Won by two yards, Time, 10 4-5 sec.

HALF-MILE.—W. M. C. Kennedy (King's School, Burton, and Cranwell), 1; M. O. Collins (Victoria College, Jersey, and Woolwich), 2. Won by 20 yards. Time, 2 min. 5 sec.

LONG JUMP.—K. M. Wright (Cheltenham and Woolwich), 19 ft. 2 in., 1 B. W. Knox (St. Columba's, Dublin, and Cranwell), 19 ft., 2.

PUTTING THE WEIGHT.—J. S. A. Salt (Dartmouth and Woolwich), 34 ft. 10½ in., 1; G. R. Beamish (Coleraine and Cranwell), 32 ft. 6 in, 2.

QUARTER-MILE.—P. R. G. Bernard (Wellington and Cranwell), 1; J G. B. Armour (Malvern and Cranwell), 2 Won by four yards. Time, 54 2-5 sec.

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The Flight Round Australia.

Wing Commander Goble and Flg. Off. McIntyre, R.A.A.F., who are engaged in flying round Australia in search of suitable bases for aircraft, had been held up at Carnarvon owing to engine trouble since Apr. 30. On May 12 they left Carnarvon and reached Perth, W.A., after a stormy flight during which they were forced to land once in a heavy swell. They have now completed over two-thirds of their journey.

Wing Commander Goble ever since leaving Thursday Island has had to contend with rain and gales most of the way. After the engine had been overhauled at Carnarvon he was compelled to alight in the open sea south of Geraldton in a heavy swell and misty rain, owing to a leaking petrol tank. On refuelling he took off successfully and was again forced to come down on the Swan River at Perth.

Since leaving Thursday Island he has been without wireless, his apparatus being abandoned there as the extra weight was not considered desirable in the flight across the Gulf of Carpentaria.

On May 13 the Fairey seaplane left Perth and alighted at Albany on King George Sound. The remainder of the flight is now due East along the coast of the Great Australian Bight to Melbourne a distance of about 1,700 miles.

Japanese Awards.

The King has given the following officers and men, formerly of the Royal Air Force, authority to wear the decorations named, which have been conferred upon them by the Emperor of Japan in recognition of valuable services :—

ORDER OF THE RISING SUN.—Insignia of the Third Class.—Col. the Hon. W. F. Forbes-Sempill, A.F.C., Master of Sempill.

Insignia of the Fourth Class.—Maj. F. C. Atkinson, O.B.E., Maj. H. G. Brackley, D.S.O., Maj. W. H. J. Eldridge, Maj. C. H. C. Smith

Insignia of the Fifth Class.—Sec. Lt W. Pollard.

Insignia of the Sixth Class.—Lt. A. W. Hatfield, Sec. Lt. A. S. Sheret, Mr. E. C. Landamore, Flt. Sjt.

ORDER OF THE SACRED TREASURE.—Insignia of the Sixth Class.—Mr. G. Redmond, Sjt. Mechanic; Mr. E. J. Adams, Sjt. Fitter; Mr. W. A. Earwater, Cpl. Mechanic; Mr. W. R. E. Satchell, Chief Mechanic.

The King has given similar authority to the following officers :—

ORDER OF THE RISING SUN.—Insignia of the Fifth Class.—Flg. Off. H. R. Vaughan-Fowler, R.A.F , and Flg. Off. A. G. Loton, Reserve of Air Force Officers.

Similar authority has also been given to Mr. G. R. Volkert, designer for Handley Page Ltd. (Order of the Rising Sun, Sixth Class).

The Prague Aircraft Exhibition.

It is gratifying to know that the British Government have again realised the importance of foreign aircraft exhibitors and have decided to support a composite exhibit to be organised by the S.B.A.C. at the forthcoming Prague Aircraft Exhibition.

Although the decision is belated (the exhibition opens on May 31), the following firms are exhibiting on the stand of the Society of British Aircraft Constructors :—Armstrong-Whitworth Aircraft Ltd. (Siskin II aeroplane); The Blackburn Aeroplane and Motor Co. Ltd. (Dart fleet-spotter aeroplane); A. V. Roe and Co. Ltd. (Avro Lynx aeroplane); Rolls-Royce Ltd. (650 h.p. Condor and 370 h.p. Eagle IX engines); D. Napier and Son Ltd. (450 h.p. Lion and 1,000 h.p. Cub engines); and Armstrong Siddeley Motors Ltd. (350 h.p. Jaguar and 100 h.p. Lynx engines).

S. Smith and Son (M.A.) Ltd. and Palmer Tyre, Ltd. will have a range of their products on the stand.

It will be seen that the S.B.A.C. exhibit will be strongly representative of British aero-engines, if not of aeroplanes. Most of the small Baltic States and even some of the bigger European countries which are now producing home-built aircraft are compelled to go abroad for aircraft engines. This point has apparently been realised to the full and it is to be hoped that the impression already created abroad that British aero-engines are the finest in the world will be considerably enhanced both during and after the Prague Exhibition.

No. 46 Squadron Dinner.

The following note has been received from an eye-witness :—

The Seventh Annual Dinner of 46 Squadron, R.F.C. and R.A.F., at the Hotel Cecil on Boat Race Night, produced a muster of about twenty-five. This is one of the very few squadron dinners that have been held without fail each year, and this is due entirely to the energy of Cecil Marchant. Sqdn. Ldr. Phillip Babington, looking very ill, called during the preliminary "Cocktail Canter" to convey his good wishes and explain his absence. A cheery dinner concluded with appropriate musical noises by Dimmock and De Wattville, after which the brothers Marchant gave their inimitable "strong man" act.

Among those present were the Padre, Colonel Ensell, Bulman, Debenham, Hughes, Lee, Taylor, Robinson, Williams, Shadwell, Manby, Quilter, Barlow and Quick. It was decided to have next year's dinner on Boat Race Night, and Marchant was again asked to undertake the duty. Old members of 46 should write: Captain C. J. Marchant, 10, Bush Lane, Cannon Street, E.C.

AIRCRAFT IN PARLIAMENT.

ANGLO-PERSIAN OIL.

On Apr. 14 the **Prime Minister**, replying to **Mr. Ormsby-Gore**, said that the present Government had no intention whatever of selling the Government holding in the Anglo-Persian Oil Company and although he was unable to bind his successors in office he would not consider that any Government would be justified in parting with the control of the company without the approval of Parliament. Furthermore he said that so far as he knew no negotiations were now going on with the group to whom Mr. Ormsby-Gore referred as "Sir Robert Waley Cohen and these people."

THAT HELICOPTER AGAIN.

In a written answer to **Mr. Hardie** on Apr. 14 **Mr. Leach** said that the Air Ministry did not propose to take out foreign patents at the public expense for the helicopter under construction at Farnborough but that the inventor had been given permission to take out such patents if he wished to do so. **Mr. Leach** added that a successful helicopter should combine a number of functions which cannot be combined in any other type of aircraft.

[This means that Mr. Brennan can, if he wishes, patent in foreign countries inventions which he has discovered at the expense of the British taxpayer. It would be a very good thing if somebody were to elicit from the Air Ministry the full history of the dealings between the Air Ministry and Mr. Brennan and how it is that we continue to spend so many thousands of pounds without results.—Ed.]

ACCIDENTS.

Replying to **Mr. B. Smith** on Apr. 14 **Mr. Leach** said that from Jan., 1920, until Mar. 31, 1924, there had been 120 flying accidents resulting in the deaths of 128 officers, 1 cadet and 55 airmen, and that there were 162 other accidents resulting in injury only. He added that every care was taken to eliminate risk and loss of life.

Replying to **Mr. A. T. Davies** on Apr. 16 **Mr. Leach** said that it was not true that the number of accidents in the R.A.F. had been relatively increasing during the past year. On the contrary the number of accidents had decreased considerably in relation to the number of hours flown. It was not possible to institute a comparison of the R.A.F. and civil flying on a basis of miles flown. Flying in the R.A.F was computed in hours not in miles. Every serious flying accident and all accidents of which the causes were at all obscure whether happening to R.A.F. or civil aircraft were investigated by the Accidents Investigation Branch. In the case of the R.A.F. a Service Court of Inquiry was held in addition to the investigation by the Accidents Committee.

It was obvious that when inexperienced pilots were being taught to fly the risk of accident was greater than when experienced pilots were flying standard machines on commercial flights over well-known routes. Practically every pilot employed in civil aviation at present was trained in Service aviation. Only a very small proportion of the accidents in the R.A.F. had been due to engine failure and engines were subject to continual overhaul and test by experienced mechanics under technical officers. The total number of serious accidents in the R.A.F. during the year ending Mar. 31, 1924, was 87 resulting in 53 deaths and 87 injuries to officers and airmen.

Replying to another question by **Mr. B. Smith** on Apr. 14, **Mr. Leach** said that in Civil Aviation between Jan. 1, 1920, and Mar. 31, 1924, there had been three fatal accidents causing 11 deaths on regular air transport routes and 12 fatal accidents causing 24 deaths in all for civil flying. Of these deaths 4 were air line pilots and 12 other civilian pilots. There had been 4 other accidents on air lines causing injuries to 16 pilots and 14 passengers.

In the House of Commons on Apr 29, **Maj.-Gen. Sir Frederick Sykes** asked the **Under Secretary of State for Air** to classify the accidents to R.A.F. machines from Jan., 1920, to Mar. 31, 1924. **Mr. Leach** whose reply was circulated in the Official Report said that the official records did not exactly correspond to the classification required but were as follows :—(1) Engine or installation failure, 90. (2) Error of judgment, 254. (3) Combination of error of judgment and engine failure, 40. (4) Defect in aircraft construction, 4. (5) Defect in aircraft design, 12. (6) All other causes, 73.

On May 1, in reply to a question by **Capt. Viscount Curzon**, the **Under Secretary of State for Air** said that 17 fatal accidents had taken place in the R.A.F. since Jan. 1, 1921. He said that recent statistics did not support the statement that there had been a very large number of engine failures and the figure quoted (58 hours' flying per engine failure) could not be verified from his Department but were presumably taken from the 1922-23 report of the Aeronautical Research Committee and referred to a period in 1922. The latest return available for the last twelve months showed that 150 hours were flown per engine failure in units at home. The proportion of engine failures due to faults of maintenance were under investigation. **Mr. Leach** said that he was quite satisfied with the standard of technical knowledge and skill of the ground staffs. All serious accidents and accidents whose cause is not clear were investigated by a Service Court of inquiry and also when practicable and necessary by the Accidents Investigation Branch of the Air Ministry.

The following reply to a question by **Sir Frederick Sykes** was circulated by the **Under Secretary of State for Air** in the Official Report on Apr. 29 :—

I am unable to accept the hon. and gallant Member's premises that the Royal Air Force compares unfavourably with civil firms as regards efficiency of engine maintenance. The problem of such firms in maintaining with a handful of mechanics a very few aeroplanes carrying out routine flights from two or three aerodromes bears no relation to that of the Royal Air Force in maintaining many hundreds of aeroplanes at stations all over the world. The system of maintenance and inspection employed in the Royal Air Force is, as a matter of fact, very similar to that employed by civil firms, with which the officers of the Service side of the Air Ministry are fully acquainted. The problem of the Air Ministry, however, is to train mechanics in the large numbers requred for the Royal Air Force and very complete arrangements exist for doing this. Civil instructors are largely used, and, in the case of new types, valuable supplementary instruction is given to selected airmen by engine designing firms at their works. I am unable to regard the suggestion that air transport firms should be asked to co-operate in the training of airmen as either practicable or advantageous.

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		—		*Dep.*	,, ,,	*Arr.*				
		11.45		*Arr.*	Brussels, Haren Aerodrome	*Dep.*		16.30		
		12.45		*Arr.*	Brussels, Palace Hotel	*Dep.*		15.30		
		12.15		*Dep.*	Brussels, Haren Aerodrome	*Arr.*		16.00		
	09.45	13.30	13.00	*Arr.*	Cologne, Bickendorf Aerodrome.	*Dep.*	11.00	14.45	15.15	
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THE IMPROVEMENT OF BRITISH MILITARY AIRCRAFT.

By W. H. SAYERS

When war ceased at the end of 1918 the British Royal Air Force was admittedly the finest flying service in the world, and was equipped—thanks to the skill and enterprise of British aircraft designers—with the finest military aircraft then produced. In the intervening five and a half years reasons of economy have led to a very considerable reduction in the strength of the R.A.F., and, until within the last year, that force has been equipped mainly with machines left over from the war.

But the Air Ministry during that period has not been idle. It has maintained an exceedingly expensive staff of technical experts, and has expended large sums of money on the development of improved aircraft for military purposes in order that when the time arrived for the re-equipment of the Air Force it should be in a position to order machines of the most satisfactory and up-to-date type.

That time has now arrived and it would seem therefore that it is an appropriate moment to survey this work of the Air Ministry and to observe how thoroughly they have discharged their functions. The obvious test is to compare British military aircraft of modern design and construction with the corresponding machines produced by the designers of other countries who have not had the benefit of Air Ministry assistance in their work.

It is unfortunately extremely difficult to make such a comparison which shall be both complete and accurate. The difficulty is increased by the veil of secrecy which the Air Ministry cast over the performances of the more recent experimental machines. It may be that beneath that veil there lurk machines of an unsuspectedly high performance—but that seems unlikely.

The only reasonably simple method of making such a comparison is to confine attention to machines of the high-performance class, and to compare on a basis of speed. In order to do this a table has been prepared, and is here reproduced, which shows the military machines of French, United States, and Dutch design and construction of recent date and of a speed of 130 m.p.h. or over, concerning which reasonably reliable information is available.

These machines have been listed in order of their speed, and against them have been listed modern British machines of equivalent speeds.

A serious difficulty arises here from the fact that in the case of most of the British machines no reliable information as to performance has been permitted to escape by the Air Ministry.

Where no authentic data is available there is usually a good deal of fairly reliable data as to the sort of performance which is either hoped for, or claimed by the designer, and, accordingly, the British machines whose speeds are not known with any accuracy have been given the benefit of every probable doubt. In some cases injustice may have been done to British aircraft but this is not at all probable.

That the general run of speeds attained by British high-speed military machines has not been seriously underestimated is evidenced by the claim made by a stout defender of the Air Ministry who lives and has his being within the Technical Department thereof, that although we have not at the moment any single-seat fighter in service that could catch a Breguet XIX we should have some capable of that feat delivered to the R.A.F. in about two or three years if all went well.

The list is confined to military machines and does not include any purely racing types. Every machine included has actually been ordered by the Government of a military Power and has been built and tested. In the majority of cases the order has been an experimental or development order—which is true of the majority of the modern British machines.

In the case of foreign machines where it is definitely known that either delivery in quantity has already occurred, or where definite orders for production have passed, the fact has been noted, but it is not safe to assume that the machines not here said to be in production are therefore still only in the experimental stage. This is particularly the case with French types.

Incidentally it should be noted that the French list is by no means complete as even the French authorities have some liking for secrecy in regard to new service aircraft.

Taking the list as it stands however it will be seen that there are in France at least five types of single-seat fighters of speeds of 160 m.p.h. and over. None of these are known to be in production. The U.S.A. has four types of 160 m.p.h. or over—one in service, and three ordered in quantity. One of the latter is a two-seater.

COMPARATIVE SPEEDS OF FOREIGN AND BRITISH MILITARY AIRCRAFT.

	Foreign.			British.		
160 m.p.h. and over.	France.					
	Gourdou Leseurre	1 seat fighter (400 Jupiter)	186 m.p.h.			
	Buscaylet-de Monge	1 seat fighter (300 H.S.)	167 m.p.h.			
	De Marçay 4	1 seat fighter (300 H.S.)	161 m.p.h.			
	Spad 61	1 seat fighter (450 L.D.)	161 m.p.h.			
	Dewoitine	1 seat fighter (300 H.S.)	161 m.p.h.			
	U.S.A.					
	†Curtiss	1 seat fighter (400 D.12)	170 m.p.h.	NONE.		
	†Boeing	1 seat fighter (400 D.12)	170 m.p.h.			
	†Thomas-Morse M.B.9.	1 seat fighter (400 Wr.)	165 m.p.h.			
	‡Thomas-Morse M.B.3.	1 seat fighter (400 Wr.)	163 m.p.h.			
	Curtiss	2 seat fighter (400 D.12)	160 m.p.h.			
	Holland.					
	Fokker D.XIII	1 seat fighter (450 N.)	168 m.p.h.			
150-160 m.p.h.	France.					
	Spad 81	1 seat fighter (300 H.S.)	155 m.p.h.	†Armstrong Whitworth Siskin	1 seat fighter (370 Jaguar)	155 m.p.h
	*Breguet XIX	2 seat fighter (400 L.D.)	150 m.p.h.	†Gloucester Grebe	1 seat fighter (370 Jaguar)	150 m.p.h.
	Holland.					
	‡Fokker D.XI	1 seat fighter (300 H.S.)	158 m.p.h.	Gloucester Mars VI	1 seat fighter (370 Jaguar)	150 m.p.h.
	†Fokker D.C.1	2 seat fighter (450 N.)	152 m.p.h.	*Fairey Flycatcher	1 seat fighter (370 Jaguar)	150 m.p.h.
140-150 m.p.h.	France.					
	Borel	1 seat fighter (300 H.S. *sup.*)	148 m.p.h. (13,000 ft.)	§Handley Page S.1	1 seat fighter (230 B.R.)	146 m.p.h
	Gourdou Leseurre	1 seat fighter (300 H.S. *sup.*)	148 m.p.h. (16,000 ft.)	†Parnall Plover	1 seat deck fighter (370 Jaguar)	140 m.p.h.
	‡Nieuport 29	1 seat fighter (300 H.S.)	145 m.p.h.	Hawker Woodcock	1 seat fighter (400 Jupiter)	140 m.p.h
	*Breguet XIX	2 seat Corps Reconn. (400 L.D.)	141 m.p.h.			
	*Breguet XIX	Bomber (450 L.D.)	141 m.p.h.			
	Borel	2 seat night fighter (300 H.S.)	140 m.p.h.			
	Holland.					
	Koolhoven 31	2 seat fighter (400 Jupiter)	145 m.p.h			
	‡Fokker C.IV	2 seat reconn. (400 L.)	145 m.p.h.			
130-140 m.p.h.	France:			*Fairey Fawn	2 seat reconn. (450 N.)	135 m.p.h
	†Nieuport 33	2 seat training (300 H.S.)	137 m.p.h.	Hawker Duiker	2 seat fighter (400 Jupiter)	135 m.p.h.
	Gourdou Leseurre	1 seat training (180 H.S.)	135 m.p.h.	Bristol Bullfinch	2 seat fighter (400 Jupiter)	135 m.p.h.
				§Bristol Fighter	2 seat fighter (400 Jupiter)	133 m.p.h.

Notes.

Figures in brackets denote nominal h.p. of engine.

Types of engine are shown by letters:—H.S. = Hispano-Suiza L.D. = Lorraine-Diétrich; D.12 = Curtiss D12; Wr. = Wright (Hispano type); N = Napier; L = Liberty; B.R. = Bentley Rotary; R.R. = Rolls-Royce. *Sup.* indicates engine fitted with supercharger.

* Machine in production and delivered in quantities.

† Production orders given, little or no delivery.

‡ Standard service types.

§ Built in Britain but not for British service.

British Standard Service Machines.

‡Sopwith Snipe	1 seat fighter (230 B.R.)	130 m.p.h.
‡Bristol Fighter	2 seat fighter (270 R.R.)	125 m.p.h.
‡Fairey 3	2 seat reconn. (450 N.)	120 m.p.h.
‡D.H 9.A	2 seat reconn (400 L.)	118 m.p.h.

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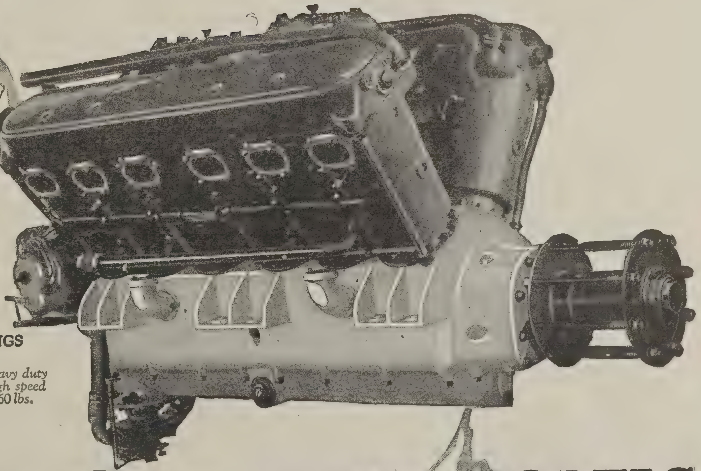


WRIGHT ENGINES MODELS T

Holland has produced one machine of over 160 m.p.h., Britain has none.

Between 150 and 160 m.p.h. France has two types one of which, the Breguet XIX two-seat fighter, has been delivered in quantity. This incidentally is the type of machine on which Lt. Pelletier d'Oisy is making his phenomenal flight to Japan and perhaps further.

In Holland Fokker has produced a single-seater and a two-seater in this speed class. In Britain there are four single-seat fighters which certainly do not come higher in the speed classification. One, the Fairey "Flycatcher," was designed as a deck-flyer, and is already in service in some quantities. Two others, it is rumoured, have been ordered in quantity and the Air Ministry is given the benefit of the doubt here as elsewhere.

Between 140 and 150 m.p.h. France has six machines—counting the two variants of the Breguet XIX. These two are in service. The Nieuport 29 single-seater has been in service since the end of the War 1914-18. It should be noted that two of these machines are supercharged single-seaters and develop nearly 150 m.p.h. at a height of 13,000 and 16,000 ft. Three of these types are two-seaters and one a bomber which has 2,000 lbs. of disposable load including fuel.

Holland has produced two two-seaters in this class.

Great Britain has produced three machines of this speed. The Handley Page was built to the order of the American Government, and the top speed attained with an obsolete engine is evidence of the continued ability of British designers when they are given a chance.

Between 130 and 140 m.p.h. it has only seemed worth while to include two French machines which are in use for the advanced training of military pilots. In the same class are four British machines—one of them the 1916 Bristol Fighter brought up to date and fitted with a modern engine. This incidentally has not been ordered by the Air Ministry. Of the other three the Fairey "Fawn" is in service—the others remain experimental.

To the end of the British list there has been attached a list of the standard types of single- and two-seat machines with which the bulk of the R.A.F. is now equipped.

Can the Air Ministry maintain that their "encouragement" of British design has produced altogether satisfactory results? The fastest British single-seat fighter is slower than the fastest foreign two-seater—and not fast enough to catch the French Breguet XIX with bombing load unless it happens to be sitting up and waiting for it. Our fastest two-seat fighter is just about as fast as a French school machine, and so far as it is possible to discover we have no military machines even in the experimental stage which are appreciably faster than were the fastest of British war-time designs.

It is undoubtedly true that the British military machine as it is now produced carries a much heavier total load than did war-time machines of similar class and that it may be a much more formidably armed appliance than were the earlier types. It may also be true that the modern British machine is stronger and more completely equipped for offence than are foreign machines of similar classes.

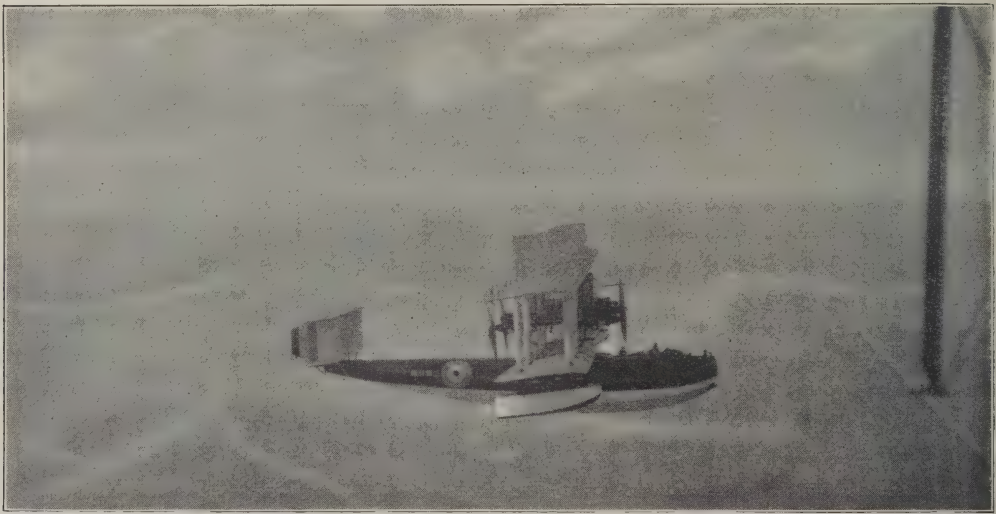
But even if this is so it has yet to be explained how British machines are to bring their superior offensive qualities to bear against opponents who should never have any difficulty in keeping out of their way!

It is true that speed alone is not a complete measure of performance in military machines of the high-performance class. For some purposes, climb, ceiling or speed at altitude may justify some sacrifice of maximum speed. But on the general principle that one at least of the duties of the R.A.F. in times of war will be that of destroying enemy aircraft, it cannot be conceded that any advantages which British machines may possess in this direction—if indeed they do possess them—can compensate for this very great inferiority in maximum speed.

A machine with a high ceiling and a fine performance at great altitudes may be very valuable if you can force the enemy machines to meet it at those altitudes. How do you force it up to your chosen level if none of your machines can catch or intercept it at medium altitudes? Are we expected to rely on anti-aircraft guns to keep all enemy aircraft at more than 20,000 ft. above British territory? It would surely do us less damage to let them get on with the bombing undisturbed.

As things are going at present it looks as if the R.A.F. in the next great war will have excellent opportunities for observing from a safe distance enemy air operations, but precious few of interfering with them. But that is not the ostensible purpose of the R.A.F.

WHERE BRITAIN STILL LEADS.



THE WORLD'S BIGGEST FLYING BOAT.—The Fairey N4 "Atalanta I." (four Rolls-Royce Condor engines, 2,800 h.p.).

Despite the extremely unsatisfactory state into which the production of modern types of high-speed fighting aeroplanes has fallen in this country under the guidance of the Air Ministry, it can still be claimed that Britain leads the world in the production of aircraft designed for naval duties. The only reasonably high performance aircraft now in service in the R.A.F. were originally designed with an eye to naval work, and the photographs reproduced in this issue of N4, the largest flying boat in the world, may be taken as evidence that in flying boat design we are still ahead of others.

N4 was designed by the Fairey Aviation Co. in 1917 for reconnaissance work with the fleet at sea. Construction on it was begun appreciably before the Armistice by Dick Kerr and Co. (now a branch of the English Electric Company). Work was apparently abandoned for a time after the Armistice, but was eventually put in hand. The machine made its first flight at the Isle of Grain on July 4, 1923, having then been delivered to the Air Ministry for not less than two years. It is at Felixstowe still undergoing tests.

It will be obvious that any credit for N4's supremacy in its particular line can scarcely be traced to the expedition with which the type has been handled by the Air Ministry, but is due to the inherent courage and ability of the original designer.

N4 is fitted with four Rolls-Royce Condor engines of 600 h.p. each. Despite the age of the design it is still among the machines which may be mentioned but not described. However, in the interval shortly after the

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England to Finland	1,100 miles
England to Warsaw	1,050 miles
England to Madrid	855 miles

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war when official interest in the machine waned, details of the machine as she was intended to be were published to the world at large, so that no harm can be done by repeating that the machine was to have been of 139 ft. span and 66 ft. long overall, with 2,900 sq. ft. of wing surface, to have a loaded weight of 30,500 lbs., carrying 1,000 gallons of fuel, or sufficient for 12 hours' flying. The estimated top speed was then of the order of 100 knots (115 m.p.h.).

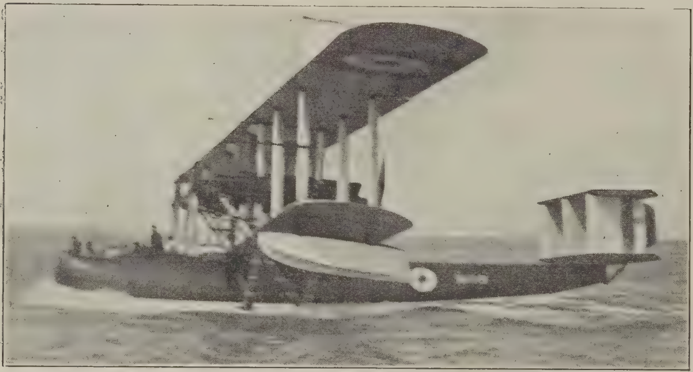
Doubtless in the interval the Air Ministry have rendered the above figures misleading, but it is well to be able to record that the machine flies excellently and handles extremely well both on the water and in the air, and that a modernised and improved edition of the type will, it is hoped, be delivered to and tested by the Air Ministry in rather less than another seven years.

IN THE AIR :—The N4 Atalanta flying during her long-deferred tests.

A Matter of History.

It may be of interest to indicate what happened during the period which has elapsed since the inception of the N4 type and what is its present condition. Altogether three machines of this type have been constructed either in whole or in part and an outline of their journeyings and their present condition is given hereafter.

The three machines are known as "Atalanta I," "Atalanta II" and "Titania."



ATALANTA I taxying.—It will be seen that at least six people are visible in the two front cockpits without any signs of overcrowding. This gives some indication of the roomy nature of the hull and the size of the machine as a whole.

The lines of the hull for these machines are it is believed identical, and were due to the late Major Linton Hope with the assistance of the staff of the Froude tank at the N.P.L. The differences between the designs of the hull of Atalanta I and Atalanta II is chiefly in detail construction.

Atalanta I :—The hull of this machine was built by May Harden and May to Major Linton Hope's design, both as to lines and as to structure. From Southampton the hull was taken in 1919 by road through Wales to Dick Kerr and Co.'s works at Lytham, the route being dictated by the fact that the huge hull could not pass under normal railway bridges. At Lytham the aircraft structure was built and the hull was then sent again by road to Grain in 1921.

The interval between its arrival at Grain and July 1923 was spent in completing the machine for test. As recorded above the machine made its first flight at Grain in that month and has since been flown to Felixstowe.

Atalanta II :—The hull for this machine was built in 1918-19 to the design of Mr. Chas. Nicholson of Camper and Nicholson, the well-known yacht designers, by the Gosport Aviation Company Ltd., on a structural system distinctly different from that adopted by Major Linton Hope. This hull was sent by road to the Phœnix Dynamo Works at Bradford in 1919, where the aircraft structure was partly completed. The incomplete machine was thereafter sent to Grain where it has been used for flotation tests. It will not be completed.

Titania :—The hull for this machine, another Linton Hope type, was built in 1918-19 on the Clyde by Fyffes', the yacht builders. It was sent by road to the Fairey Aviation Co.'s works at Hamble, near Southampton, and was moved later to the same firm's works at Hayes, near London, for the addition of the aircraft structure. The hull was sent to Grain early in 1923, and erection and completion of the machine are proceeding there at the present time.

Up to date the three hulls must have travelled close upon 2,000 miles by road—a distance probably not yet equalled by the one completed N4 in the air.

The latest information suggests that Titania, now approaching completion at Grain, should be ready for tests by the early autumn of this year—sufficiently early for the tests to be completed before winter sets in on the East Coast. But of course it may yet be decided to remove her by road from Grain to Felixstowe in order to put her more nearly on an equality with her sisters in the matter of road mileage. But perhaps, in order to give her an advantage over the rest, as a later product, it would be possible to extend her road journey to the Fleet Co-operation Station at Leuchars. It is

N4 (ATALANTA I) :—Ashore on the Isle of Grain. The figures below the wing-tip floats give an idea of the size of this machine.

The above illustration shows a Vickers "Vanguard" (23 Passenger) Aeroplane fitted with two Napier "Lion" Engines.

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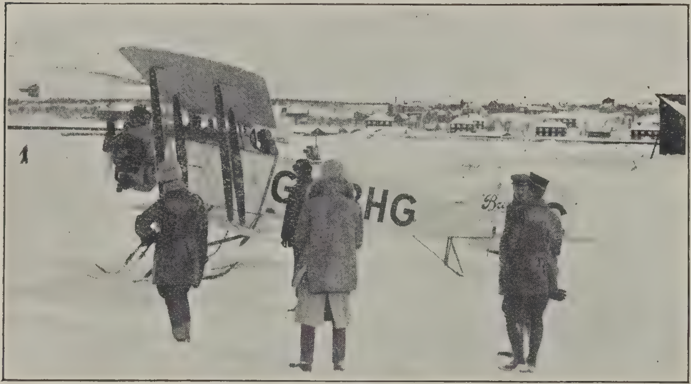

FARTHEST NORTH AGAIN.

The Jupiter-engined Bristol Fighter at Kiruna Aerodrome in the extreme north of Sweden. Note the skis, and the evident necessity for this form of alighting gear.

As is recorded in a note below the Jupiter engine was sent to this Arctic region to test its suitability for use in very cold conditions and emerged from the test with the greatest success.

true that there are no sheds there to accommodate her, and there is seldom a fleet in the vicinity, but the journey would put up her road mileage by several hundreds and she could always return by the way she went.

A Bristol in the Arctic.

An interesting and highly successful test of a Bristol Jupiter engine fitted to a Bristol Fighter has recently been made by the Swedish military authorities in order to ascertain the suitability of the Jupiter engine for use under Arctic conditions.

The machine was sent to Kiruna, which is well within the Arctic Circle. Very considerable trouble has been encountered in these regions with water-cooled engines, both oil and water have to be heated before starting and withdrawn immediately after stopping the engine. Air-cooled rotary engines give serious troubles in very low temperatures, and another type of stationary air-cooled radial which was tested under the same conditions was found to need draining of the oil after each flight and heating of the oil before restarting.

In the case of the Bristol Jupiter, Vacuum " A " oil and Shell spirit were used. The first start was made in the shed with a temperature of –8°C. (17°F.). The engine was doped and started in 1½ minutes.

As a further test the machine was left overnight in an unheated shed with the oil in the tank. The doors were thrown open at an early hour and later on with the thermometer at –12°C. (10°F.), the engine was started quickly and without trouble. The Swedish officials present expressed their astonishment at the ease with which starting occurred. During the day one flight of 1½ hours' and others of less duration were carried out.

As a further test the machine was left in an open shed all night still with the oil in the tank. During the night the temperature fell to –20°C. (–3°F.), but nevertheless the engine started at the second swing.

A climb to 3,000 m. (9,840 ft.) above the aerodrome, which is 2,000 ft. above sea-level, was made in 8½ mins. at 70 m.p.h. with the engine at 1,500 r.p.m., and the average of four flights over a speed course showed 201 km.h. (125 m.p.h.) at 1,700 r.p.m., the barometer standing at 28.25 in. and the thermometer at –10°C. at ground-level.

The machine was thereupon handed over to the Swedish military authorities, who found no difficulty in starting the engine with equal ease. The machine was then sent on an extended flight test, piloted by Lt. Gärdin, who with a passenger flew from Kiruna to Mälmslatt with two intermediate landings for fuel and oil, covering the distance of 1,300 km. in an overall time of 10½ hours, and a net flying time of 6½ hours, an average of 200 km.h. (124 m.p.h.).

Lt. Gärdin stated that the engine and machine behaved perfectly throughout, the engine running like a clock.

The Swedish military authorities were thoroughly satisfied as to the suitability of the Jupiter engine for work in Arctic regions and as to the flying qualities of the Fighter, and at once accepted delivery of the complete machine. As the Jupiter has already conclusively proved its suitability for tropical service, it is now rightly claimed that it is an engine which can be regarded as entirely indifferent to the extremes of climatic variation.

Progress in Yugo-Slavia.

M. Thierry the chief pilot of the Ateliers d'Aviation Louis Breguet has been demonstrating a Breguet XIX A2 biplane (400 h.p. Lorraine-Diétrich engine) at Novisad aerodrome in Yugo-Slavia.

As a result of this demonstration an order for 100 Breguet XIX A2s has been placed by the Yugo-Slavian Flying Corps.

Only recently it was reported that a batch of Dewoitine D.1.C.1. single-seat fighters (300 h.p. Hispano-Suiza engines) had been delivered at Belgrade for the Yugo-Slavian Flying Corps.

The Institute of Transport at Bristol.

The fourth annual Congress of the Institute of Transport is to be held at Bristol on May 29, 30 and 31. The proceedings will consist of the usual compound of social functions, of papers on subjects within the scope of the Institute's activities and of visits to works of interest to the members.

Special aeronautical interest attaches to this congress in view of the fact that Sir Henry White-Smith, C.B.E., of the Bristol Aeroplane Company, is chairman of the Local Committee. A paper entitled " The Next Five Years of Aerial Transport " by Lt.-Col. W. A. Bristow is to be read on the morning of May 30, and a visit is to be paid to the Bristol Aeroplane Co.'s works at Filton on the afternoon of the same day.

Italian Patriotism Abroad.

The Regia Aeronautica or Italian Royal Air Force is being enlarged to the extent of 60 aeroplanes which have been presented to Signor Mussolini by the most important Italian " Fasci " abroad. The aeroplane presented by the " Fascio " of Rio de Janiero has already been despatched.

Italian International Race Regulations.

The Commissariat of Aeronautics has drawn up the regulations for the 1924 International Races for the " Gran Coppa d'Italia " and the " Gran Coppa del Tirreno," the former for aeroplanes and the latter for seaplanes.

These contests to be held during the summer are open to any aircraft having the following characteristics :

Monoplanes or biplanes, with fuselage of aeroplanes and with central boat if seaplanes, dual control, h.p. 40-90, maximum speed to exceed 62.5 m.p.h., minimum speed under 40 m.p.h. with a useful load including pilot, but excluding fuel of 390 lbs.

The races will be flown over a closed circuit of 187.6 miles without intermediate landings.

The winner of each contest will be the pilot who has completed the course with the highest figure of merit according to a formula based on the commercial speed, the useful load and the fuel consumption.

The prizes for each race amount to 200,000 lire.

A Fast French Commercial Flight.

On Apr. 15 an aeroplane belonging to the Cie Franco-Roumaine carrying several passengers flew from Prague to Paris in seven hours' flying time, after stopping at Strasbourg for a hour and a-half for lunch.

The time taken represents a gain of more than 30 hours over the train service.

A Napier Record.

Intimation has just been received that Herr Otto Ballod's achievement in reaching a height of 21,414 feet, whilst carrying a load of 1,102½ lbs. at Buenos Aires recently, has been homologated by the F.A.I. as a world's record. Herr Ballod was flying a Fokker C.IV. machine with a 450 h.p. Napier engine.

More About Wembley.

S. E. Saunders Ltd., Yacht and Aircraft constructors, of East Cowes, Isle of Wight, are represented at the British Empire Exhibition with a stand in the Palace of Engineering (Avenue 1, Bay 17) where they are displaying specimens of their products. These include several examples of Saunders' " Consuta " Sewn Plywood.

The firm extends an invitation to visitors to the Exhibition to their stand, where all information concerning their work will be gladly given.

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The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 13; Tuesday, 11, Wednesday, 14; Thursday, 9; Friday, 15; Saturday, 12; Sunday, 12.

LONDON—PARIS AND LONDON—COLOGNE:
Imperial Airways, Ltd., machines 37, passengers 63, freight —.
PARIS—LONDON:
Air Union, machines 34, passengers 118, freight 23,841 lbs.
LONDON—ROTTERDAM:
K.L.M., machines 12, passengers 27.
SPECIAL MACHINES:
De Havilland Hire, machines 1, passengers 2.
Surrey Flying Services, machines 2, passengers 1.

Total number of trips by British machines: 40, carrying 66 pas. Foreign machines: 19, carrying 64 passengers.

COMPARATIVE FIGURES:
For week ending May 11:
Machines, 86; Passengers 211; Crews, 128; Total personnel, 339.
Corresponding week, 1923:
Machines, 109; Passengers, 444; Crews, 177; Total personnel, 621.
Corresponding week, 1922.
Machines, 114; Passengers, 215; Crews, 186; Total personnel, 401.
Corresponding week, 1921:
Machines, 75; Passengers, 230; Crews, 90, Total personnel, 320.
Corresponding week, 1920:
Machines, 84; Passengers, 103; Crews, 57; Total personnel, 190.

Croydon Notes.

Imperial Airways started up last week and by now the full services are in operation. W8b Handley Pages are running on the Cologne route and D.H.34s on the Paris route. A service is also being operated to Birmingham for the British Industries fair.

The French and English newspapers have wasted much ink in chronicling the wonderful record of a Goliath which flew from London to Paris back to London and on to Paris again. This is, of course, a record for a Goliath, but D.H.34s on the Daimler Airway did this regularly day in day out with still an extra journey back to London thrown in as far back as 1922. That is to say the regular day's work was two there-and-back trips in the day.

[One believes that on one occasion Mr. E. D. C. Herne made three there-and-back trips in a day; one outward with early morning papers and back for a late breakfast; one with the morning machine and back to tea; and one after tea and back for a late dinner about 21.30 hrs.—C. G. G.]

For the A.D.C. Mr. Perry tested a couple of Avros during the week and much work was done in the shops.

Royal Aero Club Sub-Committees.

The following Sub-Committees have been appointed for the year 1924:—

RACING:— Maj.-Gen. Sir W. S. Brancker, K.C.B., Lt.-Col. M. O. Darby, Group Capt F. W. Bowhill, C.M.G., D.S.O., R.A.F., Lt.-Col. W. A. Bristow, Capt. R. J. Goodman Crouch, The Lord Edward Grosvenor, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lt.-Col. A. Ogilvie, C.B.E., Sir Guy Standing, K.B.E., Mr. Howard T. Wright.

TECHNICAL:—Mr. Griffith Brewer, Eng Com W Briggs, R.N., Major J S. Buchanan, Lt.-Col. C. B. Heald, C.B.E., Major R. H. Mayo, Lt.-Col. M. O'Gorman, C.B., Lt.-Col. H. W. S. Outram, C.B.E., Sq. Ldr. M E. A. Wright, A.F.C

FINANCE:—Mr. Ernest C. Bucknall, Lt.-Col. M. O. Darby, Mr. J. Stewart Mallam, Lt.-Col A. Ogilvie, C.B.E., Mr. F. Handley Page.

HOUSE:—Maj. H. Graeme Anderson, Mr. Ernest C. Bucknall, Maj Herbert J. Corin, Mr. D. C. MacLachlan, Mr. J. Stewart Mallam, Capt. D. G Murray, Capt. L. V. Pearkes, Maj. S. V. Sippe, D.S.O.

FLYING SERVICES FUND:—Group Capt. F. W. Bowhill, C.M.G., D.S.O., R.A.F., Lt.-Col. Alan Dore, D.S.O., Mr. Chester Fox, Mr. D. C. MacLachlan, Capt. D. G. Murray.

LIBRARY:—Mr. C. G. Grey, Maj. C. C Turner, Mr. Howard T. Wright

JOINT STANDING (R.AE.C. & S.B.A.C.):—Lt. Col. F. K. McClean, A.F.C., Maj.-Gen. Sir W. S Brancker, K.C.B., Lt.-Col M. O. Darby, Lt.-Col A Ogilvie, C.B.E.

The following are *ex officio* Members of all Committees:—The Chairman, Lt.-Col. F K. McClean, A.F.C.; Vice-Chairman, Lt.-Col. John D. Dunville, C.B.E.; Past Chairman, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Past Chairman, Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P. ...

An Ally of the Air.

Those who had the pleasure of working with Captain Guest when he was Secretary of State for Air and realise how much useful work he did will be interested in the following statement from the *Daily Telegraph*:—

> Captain the Hon. F. E. Guest, who now represents the Stroud Division in the House of Commons, is to fight North Bristol at the next General Election as an anti-Socialist candidate. This seat was won by a Labour-Socialist last autumn, and it is recognised that it can be recovered if the two Constitutional parties unite in support of a candidate who possesses qualifications of the right kind. Captain Guest, as one who shares the views of Mr. Churchill, has the goodwill of both the Unionist and the Liberal associations in the constituency.

Speeding-up in Russia.

On May 1 the Deutsch-Russische Luftverkehrs Gesellschaft which operates the Moscow-Königsberg air line will increase its weekly service from three to six trips in each direction.

THE GLOBE TROTTERS.

THE BRITISH EXPEDITION.

Sq. Ldr. A. S. C. Maclaren who was forced to land at Parlu on Apr. 26 owing to engine trouble sent the following telegram to *The Times* on May 8 from Karachi:—

> Owing to the hospitality of the Maharajah of Jodhpur, we are very comfortably settled in tents at Parlu, and the machine is partially protected with tarpaulins. It is attached to rails and sleepers supplied by the Jodhpur-Bikanir Railway. An aerodrome has been specially prepared for our departure.
>
> A new engine from Baghdad arrives at Karachi to-day, and will be modified to suit our machine. It will be dispatched to-morrow morning, in order to arrive at Parlu early on the morning of May 10. With luck, the machine should be ready the same night, and we should leave on the following morning, *via* Jodhpur, for Nazirabad.
>
> It is appallingly hot, and there have been many sandstorms. The hull of the machine is swathed in tarpaulin bandages and two men are employed all day throwing water on it from a deep well, which fortunately is near. The crew are all well and are ready for further action.

The modification mentioned in the above paragraph possibly refers to its conversion from a tractor to a pusher engine, as the Napier engines used in Iraq are all tractors fitted to the Vickers Vernon troop-carriers. This engine is of the high-compression type. A low-compression engine was despatched from England on May 1 and will reach Karachi on May 17.

Sq. Ldr. Maclaren's departure from Parlu which it had been hoped would have been made on May 12 has been delayed owing to radiator trouble, but it was expected that he would be able to get away on May 13.

THE AMERICAN EXPEDITION.

Very heavy weather has been experienced in the Northern Pacific, greatly hindering the American Round-the-World expedition, whose progress has been very slow since leaving Sitka.

On May 2 Lieut. Lowell H. Smith received instructions to proceed without Major Martin who was missing after leaving Chignik on Apr. 30, and on the following day the three Douglas World-cruisers left Dutch Harbour for Atka Island where they arrived the same day. On May 9 they left Atka Island and arrived at Attu Island the westernmost of the Aleutian Islands in 8 hrs. 50 mins. flying.

On May 11 information was received that Major Martin and his mechanic, Sergt. Harvey, had arrived safely and unhurt at Port Moller, Alaska, 75 miles south-west of Chignik.

It appears that Major Martin left Chignik on Apr. 30 in heavy weather and that he was overtaken by heavy gales and snowstorms almost immediately after leaving.

In a wireless message from Major Martin he reported his aeroplane as being totally wrecked, having flown into a mountain in fog.

The two aviators arrived at a trapper's cabin in Port Moller Bay on the morning of May 7 in an exhausted condition, having subsisted on concentrated foods for over a week. Here they found other food and after resting for three days they walked down to the beach where they regained contact with civilisation.

THE PARIS—TOKIO FLIGHT.

As reported in THE AEROPLANE last week, Lieut. Pelletier d'Oisy, who is attempting to fly from Paris to Tokio on a Breguet XIX biplane (400 h.p. Lorraine-Dietrich engine) had reached Calcutta on May 5 after having flown from Villacoublay to Calcutta in 51½ hours' flying time. Here it was found necessary to make some minor repairs to the fabric on the top plane which had been affected by the high temperature experienced after leaving Karachi.

These repairs having been made he left Dum-Dum aerodrome, Calcutta on May 9 at 05.45 hrs. and landed at Rangoon at 13.30 hrs. During this 800-mile flight he experienced further trouble with the fabric on the top plane and in addition he lost all his radiator water owing to vaporisation, so that instead of flying direct to Bangkok he was forced to land on the Maidan at Rangoon amongst cows and goal-posts. Here he made hurried repairs and left again the same afternoon for Bangkok where he landed at 18.00 hrs. (local time).

Thus he again performed the remarkable feat of covering 1,200 miles in less than 11 hours' flying time.

On May 11 he left for Saigon, the capital of French Cochin-China.

Lieut. Pelletier d'Oisy arrived at Saigon from Bangkok at 13.15 hrs. His flight from Bangkok, a distance of 500 miles, took seven hours which is considerably slower than any of his previous flights. This is accounted for by strong head winds and storms. At one time he was forced to fly at 10,000 feet to get above some of the heaviest weather.

On his arrival at Saigon the President of the French Republic sent him the following telegram:

> The whole country is following with pride and emotion the magnificent enterprise which you and your companion are pursuing with such

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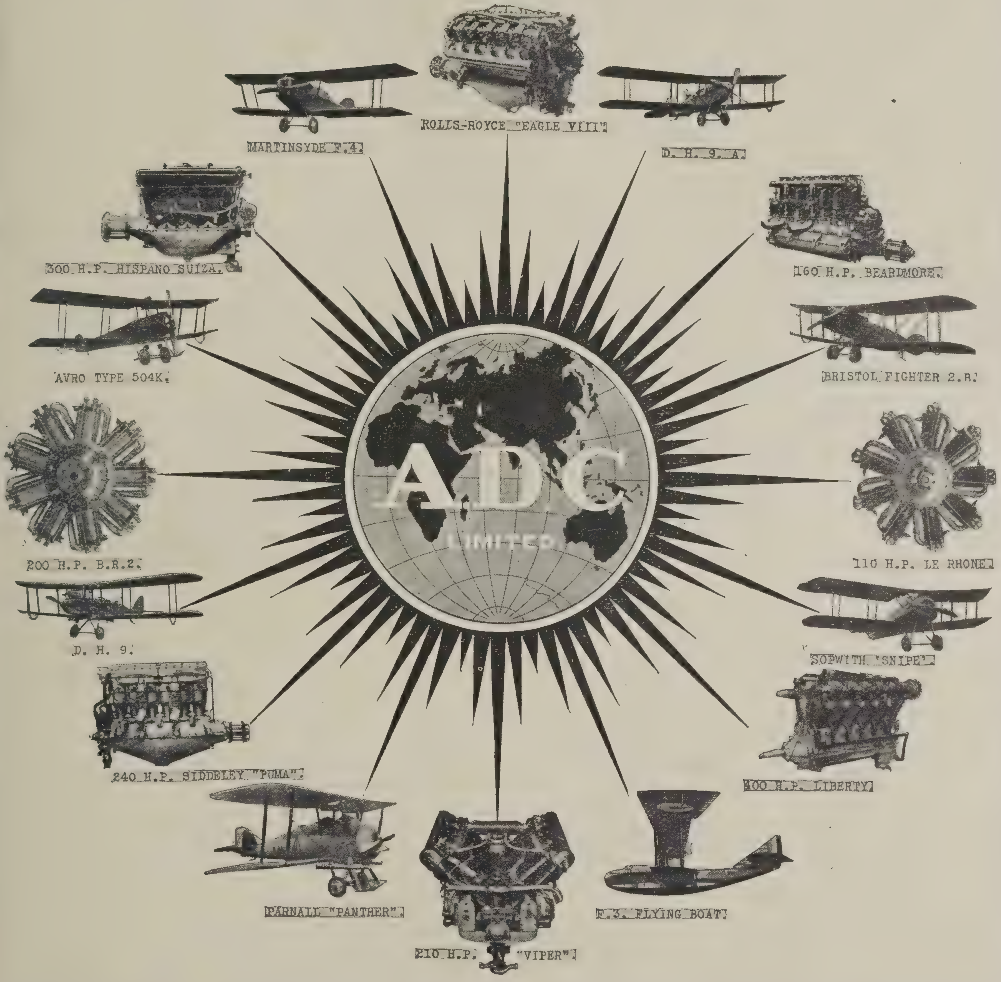
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admirable energy. I send you my congratulations and my fervent wishes for a happy issue of your enterprise.

Lieut. Pelletier d'Oisy is preparing to leave Saigon for Hanoi, a distance of 805 miles, immediately.

Hanoi was to have been the terminus of the flight when it was first projected towards the end of 1923, but owing to the large number of long-distance flights being undertaken during 1924 and the inability of the French Government to finance a Round-the-World flight it was decided to extend the Paris-Hanoi flight to Tokio. On the conclusion of the Paris-Tokio flight Lieut. d'Oisy will return by air to Hanoi, turn his machine over to the French Aéronautique Militaire stationed in Indo-China and return to France by boat.

The Lisbon—Macao Flight.

As reported in The Aeroplane last week, the Portuguese military aviators, Capt. Brito Paia and Lieut. Sarmento Beires, together with the mechanic Gouvea who joined them at Tunis, who are attempting to fly from Lisbon to Macao in China on a Breguet biplane, arrived at Karachi on May 4.

On May 7 they left Karachi for Agra but were forced to land at Pipar, near Jodhpur, owing to a particularly violent adverse wind, the machine being badly damaged.

A new aeroplane is being despatched from Lisbon, fitted with tropical radiators to enable them to continue their flight to Macao.

Mortgages and Charges.

Sir W. G. Armstrong Whitworth and Co., Ltd.

Supplemental Trust Deed Securing £2,000,000 Further Second Debenture Stock :—A Trust deed dated Mar. 31, 1924 (supplemental to trust deed dated July 5, 1920), to secure £2,000,000 further second mortgage debenture stock carrying interest at 6½ per cent. redeemable at a premium of 2½ per cent. and ranking pari passu with £2,000,000 like debenture stock secured by the original trust deed, has been registered. Property charged :—The property and assets of the company, comprised in the specific and floating charges created by the original trust deed. Trustees :—The Law Debenture Corporation, Ltd., 24, Old Broad Street, E.C.

Blackburn Aeroplane and Motor Co., Ltd.—Mortgage dated Apr. 6, 1924, to secure £8,000, charged on certain lands and company's interest in buildings thereon in Elloughton-cum-Brough. Holder :—J. B. Harrison-Broadley, Welton House, Brough, Yorks.

Mr. Keep's Accident.

His many friends in the Air Force and in the Aircraft Industry will very much regret to hear that Capt. A. S. Keep, chief test pilot of the Westland Aircraft Works, had a very bad accident on Friday last. Rumour has it that he was flying the experimental monoplane built on Voyovodsky lines which the firm is known to have been building for some time, but as the machine is a secret product no official information is available on this point.

It has been necessary to amputate Captain Keep's left leg below the knee, and his right leg is so severly injured that it was doubtful at the beginning of this week whether it could be saved. He is bearing up wonderfully well under the shock and stress of his accident and everyone will hope that after his recovery he will still be able to perform useful work.

Captain Keep has always been immensely popular both in the R.A.F. during the War and wherever he has been in connection with Civil Aviation. Everyone will wish him an early recovery and will sympathise deeply with his young wife in her anxiety for his welfare.

PERSONAL NOTICES.

Deaths.

JANSON.—On Apr. 27, at Haslemere Hospital, Dorothy Mary (*née* Bushby), wife of Lt.-Col. S. Janson, late R.A.F.

JONES.—At Shotwick, on Apr. 29, as the result of a flying accident, Thomas Percy Taylor Jones, Flg. Off., R.A.F., aged 29.

KEMP.—On Apr. 11, as the result of a flying accident in Iraq, Walter Horace Ernest Kemp, A.F.C., Flt. Lt., R.A.F. Flt. Lt. Kemp was posted to 84 Sqdn. on Mar. 2 from the Aircraft Depot, Karachi. He is the son of Mr. Ernest Kemp, of Buenos Aires.

MARTIN.—On May 2, at Duxford, Cambs, Eric Martin, M.C., Plt .Off. R A.F., aged 29.

Mr. Martin's Bristol Fighter came into collision with an Avro from the same station. At the inquest Sq. Ldr. Bailey said that he could only suggest that the two pilots failed to see each other.

One who knew him well writes :—

"By the death of Eric Martin the Royal Air Force has lost one who was destined, one feels certain, to become one of its outstanding personalities. He was one of the cheeriest people one could possibly meet, and his ready infectious laugh is a living memory with all who knew him. He won the M.C. in the infantry for a particularly stout bit of work. He was among the finest club cricketers in England. He had played regularly for Middlesex for the past few years. He captained the Finchley side for several seasons. He was also a Corinthian and Casual footballer.

"He was for some years Games Master at Christ's College, Finchley, but when the County Schools cut down masters' salaries below a living wage he felt that he must leave, and he rejoined the R.A.F. at his own earnest desire

"Eric Martin leaves a young widow, a daughter aged 4, and a son of fifteen months"—M. G K.

PELLEW.—On Mar. 29, at Duxford, Cambridge, the result of a motor-cycle accident, Plt. Off. Edward Humphrey Langford Pellew, R.A.F. (Jock), the dearly-loved son of Major V. H. L. Pellew, M.C., R.A., and Mrs. Pellew.

RICHARDS.—At Shotwick, on Apr 29, as the result of a flying accident, AC. Cyril Sydney Richards, R.A.F., aged 22.

The evidence of flying officers, who witnessed the accident at Shotwick, in which Mr. Jones and AC. Richards were killed was that the pilot at a height of 200 ft. turned too sharply to the left. The machine went into a vertical spin, and on striking the ground burst into flames. The opinion was expressed that the accident was due to an error of judgment on the part of the pilot, who was an experienced and steady officer. The machine, which was new, was airworthy.

The Coroner, in returning a verdict of "Accidental death," said that the pilot was an experienced man, but it seemed that his judgment failed him. No blame was to be attached to anyone.

RYAN.—On Apr. 18, at Heliopolis, Cairo, Cpl. Ryan, R.A.F. Cpl Ryan was murdered by a native student who has since confessed to the crime stating that his object was to create trouble between Great Britain and the Zaghloulists

The Egyptian Government state that the Grand Chamberlain has expressed to Viscount Allenby the King's deep sympathy and condolences. The Foreign Minister called at the Residency to express the regret and deep sympathy of the Egyptian Government.

Engagements.

BAILEY—DAVIES.—The marriage arranged between Capt. G. Buchanan Bailey, D.F.C., son of Mrs. G. M. Bailey, C.B.E., J.P., of Newport, Mon., and Miss D. Margaret Davies, only daughter of Sir John and Lady Davies, of Gowerton, Swansea, will take place, quietly, in London early in June.

BUTCHER—HAWORTH-BOOTH.—A marriage has been arranged and will take place in June between Flt. Lt Frank L C. Butcher, R.A.F., only son of Mr. and Mrs. Leonard W. Butcher, of Campfield Place, Leith Hill, Surrey, and Constance Cordelia, only daughter of Rear-Admiral Sir Francis and Lady Haworth-Booth, of Haworth Hall, Hullbank, Hull.

DAVIES—TUDOR.—The engagement is announced of Edward Dayrell Handley Davies, R.F., elder son of Captain Dayrell Davies (late R.N.), and Mrs. Dayrell Davies, of South Testwood, Hants. to Aldyth, eldest daughter of Brig.-Gen. and Mrs. E. T. Tudor, Waverley Court, Camberley.

HUME—YORKE.—A marriage has been arranged between Lorena Montague, daughter of Mrs. Yorke and the late Mr. Alexander Yorke, of Ottawa, Canada, and Sq. Ldr. Duncan Clive Mackenzie Hume, of the Royal Canadian Air Force, Headquarters Staff, Ottawa, son of Mrs. Hume and the late Mr Duncan Hume, of Bournemouth, England.

LLOYD—JEFFERIES.—The marriage arranged between Flt. Lt. Kenneth Buchanan Lloyd, A.F.C., R.A.F., younger son of Maj. and Mrs. T. W. Lloyd, of New Quay, Wales, and Nellie Sanforth, eldest daughter of Mr. and Mrs. Herbert Jefferies, of The Mead, Long Ashton, Somerset, will take place on June 7, at All Saints', Long Ashton.

RAYNER—SHELTON.—The engagement is announced between George James Rayner, late Flg. Off., R.A.F., and Muriel Evelyn, the youngest daughter of the late Mr. and Mrs. A. C. Shelton, of Bedford.

ROBB—BELL-IRVING.—The engagement is announced of Mr. Hugh Boulton Robb (M.C., late R.F.C.), son of the late J. Montague C. Robb, and Mrs. Robb, of Chitley Place, Liphook, Hants, and Mary McBean, third daughter of Mr. H. O. Bell-Irving and Mrs. Bell-Irving, of Vancouver, British Columbia.

Marriages.

HAIG—HUDSON.—The wedding took place on May 8, at St. James's, Piccadilly, of Flt. Lt. R. de Haga Haig, R.A.F., son of Col. H. de Haga Haig, late R.E., and Mrs. Haig, with Valerie, daughter of Mr. and Mrs. Robert Hudson, of Westwood, Tuxford, Notts. ,

LOVIBOND—PEARCE.—On Apr 26, at St. Nunn's Church, Pelynt, by the Rev. Canon Grigson, William Oliver Lovibond, of Uxbridge, to Kathleen Pearce, O.B.E., late Administrator W.R.A.F., eldest daughter of W. V. Pearce and Mrs. Pearce, of Pelynt.

TREVOR—WOODHOUSE.—On Apr. 17, at Ismailia, Egypt, Alan Trevor, R.A.F., son of Col. and Mrs. Philip Trevor, of Rodneystone, Richmond, to Peggy, daughter of Mr. and Mrs. Vernon Woodhouse, of Bury Studios, Chelsea.

WEARE—CHERRY DOWNES.—On Apr. 30, at St. Paul's, Knightsbridge, by the Rev. B. W. Keymer, O.B.E., late Chaplain R.A.F., Flt. Lt. Frank Gerald Craven Weare, M.C. (retired), only son of Mr. and Mrs. F. Weare, of The Dell, Tunbridge Wells, to Eleanor Rachel, only daughter of Mr. and Mrs. H. D. Cherry Downes, of Southfield House, Newark-on-Trent.

Births.

DUKE.—On Apr. 15, at Victoria, British Columbia, to Armine, wife of Lancelot de S. Duke, D.F.C., late Capt., R.A.F.—a son.

HAYWARD.—On May 6, at Bircham Newton, Norfolk, to Doris, the wife of Sq. Ldr. C. H. Hayward, R.A.F.—a daughter.

HOLLAND.—On May 10, at 16, Carlisle Mansions, S.W., the wife of Capt. W. T. F. Holland, A.F.C., The Grange, Hook, Hants—a daughter.

JOHNSTON.—On Apr. 22, at Heaton Chapel, to Dorothy Eleanor and Captain James Emerson Johnston (late Ches. Regt. and R.F.C.)—a daughter.

LORAINE.—On Apr. 17, at "Birchfield," Roehampton, S.W.15, to Lt.-Col. and Mrs. Robert Loraine—a daughter.

AEE Engng

THE AEROPLANE

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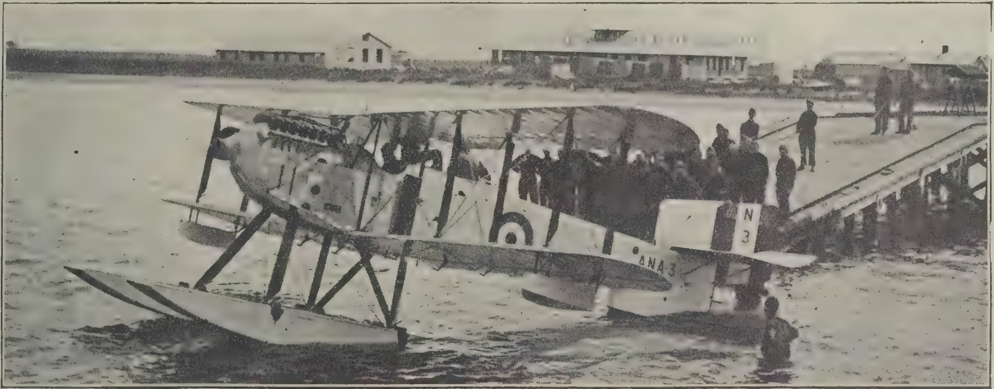
ADVANCING AUSTRALIA.



THE CIRCUM-CONTINENTAL EXPEDITION:—The Fairey IIID (Rolls-Royce Eagle Engine) on which Wing-Commander Goble, D.S.O., O.B.E., D.S.C., Assistant Chief of the Air Staff, Royal Australian Air Force, and Flying-Officer McIntyre, R.A.A.F., have made the circuit of Australia in search of suitable bases for the R.A.A.F. coast defence against Japanese aggression.

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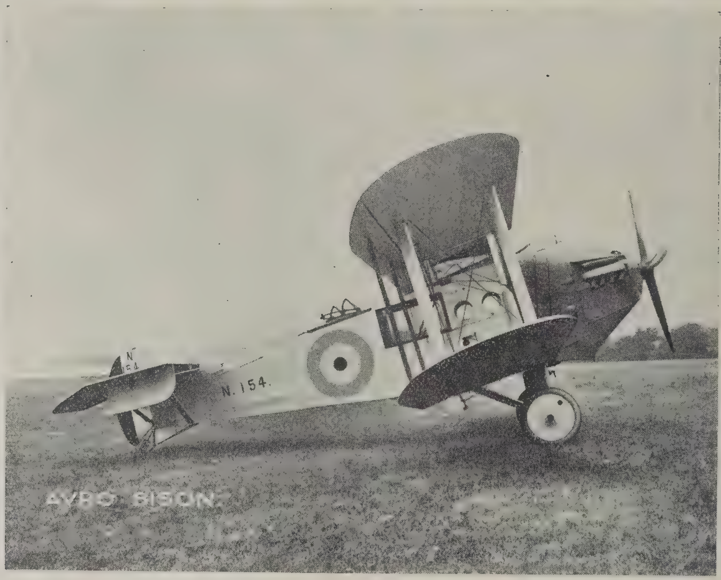

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ON THE AUSTRALIAN TRIUMPH.

By completing the Circuit of Australia Wing Commander Goble and Flying Officer McIntyre of the Royal Australian Air Force have put up a performance which may fairly be claimed as the finest flight in the history of Aviation.

On their arrival at Melbourne on May 19 they had covered 8,568 miles in 44 days, an average of about 200 miles a day, in 90 flying hours, or only a little less then 100 miles an hour over a course which faced every point of the compass. But they were not out to break records or to "put up a stunt," as the modern phrase has it. Their task was to make a rapid survey of the coast of Australia with a view to judging where coast-defence air stations may best be placed.

They were not able to devote their time ashore to overhauling their machine and resting, they had to make notes, write reports and interview local people as to the topographical and meteorological peculiarities of each locality. They had no prepared aerodromes. They had no prepared bases with spares and facilities for repairs. They just pushed off from Melbourne on a three-year-old Fairey seaplane with a Rolls-Royce Eagle VIII engine, flew round Australia and did their job.

Without in any way detracting from such performances as the trans-Atlantic flight or the England-Australia flight, or the England-South Africa flight, or the more recent flight by M. Pelletier d'Oisy to Indo-China, one can say unhesitatingly that the Australian flight is a better piece of work than any of them. It has called for a more prolonged effort than some of the great flights of the past and it has been done without the external assistance and vast preliminary organisation which alone have made the others possible. It was a plain two-man job and it has won for the Royal Australian Air Force the admiration of all the World's aviators.

Also, the durability and reliability shown by the Fairey seaplane and the Rolls-Royce engine (both of wartime design and largely of wartime production so far as material is concerned) under the stress of this continued work in tropical sun and rain have established once more the reputation of English aircraft design and material in the esteem of the aeronautical authorities of foreign nations, a reputation which must have been considerably shaken by the meteoric success of M. d'Oisy.

Wing Commander Goble and Mr. McIntyre have done a very great service to British Aviation and they deserve the thanks of the Empire. One can only hope that their performance may arouse in Australia that enthusiasm for aviation which is necessary if that continent is to be adequately defended. The Australians are under no delusions about the Japanese peril. They know that Australia must be defended, but the older men who are in authority still retain their faith in that obsolescent institution defence by warships. It may be that the Goble-McIntyre flight will prove to be the turning point in favour of air defence. Should it be so then the two heroes of the moment may well be heroes to posterity.—C. G. G.

A MATTER OF PRINCIPLE.

In all walks of life principle should take precedence over self-interest. A noteworthy case in point is the refusal of Lt.-Col. G. L. P. Henderson to apply for a post as pilot with Imperial Airways Ltd. Owing to Col. Henderson's seniority he was unanimously elected President of the Pilots' Federation and as such it became his duty to criticise the management of Imperial Airways Ltd. In view of the attitude he took in his official position towards the officials of the combine he felt that he could not properly serve under them.

Presumably Col. Henderson is not so well off that he can afford to behave in this way merely for his own satisfaction, so his attitude is the more praiseworthy.

During the dispute there were many high-sounding words from the ringleaders, and some proclaimed with much dramatic effect that they would rather die then serve under such men as they alleged to be seeking sanctuary on and behind the Board of Directors of Imperial Airways Ltd. One would have felt respect for these embryo politicians if they had had the same courage of their convictions as Col. Henderson has displayed. Of all the members if the Pilots' Federation Col. Henderson is the one whose absence would be most felt by Imperial Airways.

The position is the more remarkable in that during the agitation Col. Henderson was before all others ready to negotiate on reasonable terms and more than any other ringleader preached moderation to his followers. Although he did not agree with many of the arguments and claims put forward by the Pilots' Federation he, as President, made those claims on behalf of the Federation and it seems that he now feels that he and he alone is bound personally by words which he uttered in his official capacity.

His decision in not applying for employment by Imperial Airways Ltd. is a *beau geste* worthy of an officer and gentleman such as he proved himself to be in time of war, and it does much to raise the average status of professional civilian aviators which has not been improved by the Trade Union attitude of some of the other members of the Federation. It is to be hoped that his example may have the moral effect which it deserves and that Civil Aviation may yet find for him employment worthy of him as a man and a pilot.

ON THE POSITION OF AIR-LINE PILOTS.

So much has been said and written of late about the position of air-line pilots in the general scheme of things that it seems well to discuss the subject once more and then drop it until Civil Aviation has developed to an extent which will justify the arguments of one side or the other. Briefly the two extreme points of view are (A) that an air-line pilot is a kind of demi-god, a hero of the air combining the gallantry and resource of a fighting pilot who has won the Victoria Cross with the skill and judgment and navigational ability of the captain of an Atlantic liner, and (B) that he is a slightly glorified 'bus-driver. The truth, as in all violent argument, lies somewhere between the two extremes.

Something approaching the first extreme is set forth in a letter recently received from an experienced pilot whose point of view is that of an onlooker, in that he is no longer an air-line pilot and has watched the dispute between Imperial Airways Ltd. and the Pilots' Union from a distance of several thousand miles. Here is what he says :—

> It seems to me that you, as an exponent of Civil Aviation, would have been the last to adopt such an attitude towards the pilots. and I can see no foundation for it. Admittedly, there may be various unruly souls, who through temperament or other causes may make a certain amount of trouble for the directors (of Imperial Airways, Ltd.) but surely the attitude should be taken that the pilot, far from being a tram driver or express driver as you have called him, is more to be compared to a Ship Captain.
>
> It does not appear to make any difference if the captain of the "Majestic" is responsible for several thousand souls whereas the captain of the air liner is only responsible for seven or eight. The responsibility for human life is the same, and a high grade of mentality in both cases is essential.
>
> Tom Jones driving the London-Birmingham Railway Express has a purely mechanical operation to perform. He goes at a certain speed and stops if someone in a signal tower tells him to, or in a fog if a couple of detonators go off, and even in case of an unforeseen circumstance may stop and ask for instructions en route. The pilot of the Air liner has to act during the flight entirely on his own initiative and has no set rules to govern his conduct whilst in the air any more than the ship captain has on the high sea when he meets an iceberg.
>
> Under existing circumstances, no one with the slightest knowledge of facts can pretend that any two flights between London and Paris, for example, can be conducted in the same way, except possibly on those rare occasions when the weather is good right through.
>
> The captain of the liner does not sit in his cabin and leave the work to subordinates, but takes his place "at the stick" under any extraordinary condition. Rather than detracting from the pilot's position that he has no one to delegate to command during slack periods, surely it increases it.
>
> In conclusion, although I am not sure that the Airline Pilots have improved their position by becoming members of a trade union, yet I am sure that it is only a matter of time before their true position as captains is recognised.

Of course one does not expect any of the early air-line pilots to agree with one's attitude about the position of air-line pilots of the future. Also it is rather hard to make an aeroplane pilot understand the immense amount of skill and experience required to drive a main line express. However to take the points in the letter in order, here are the answers :—

(A) There is a vast amount of difference between the responsibility put upon an engine-driver who has about £30,000 worth of rolling stock and anything up to five hundred human lives in his care and that of an aeroplane pilot who is responsible for perhaps £4,000 or £5,000 worth of flying stock and a dozen or two lives.

(B) If an engine-driver with as little experience of his job and as little technical knowledge as has the average air line pilot were put onto a main line express and ordered to keep to schedule time he would wreck his train inside of a week. Few people realise that no man is trusted with an express till he has had at least ten years' experience of engine driving, as alternately fireman and driver, and something like three years' experience as a fireman of the particular section of line over which he has to drive his express. He has to know exactly the speed at which to take every curve, otherwise he will either lose time through going too slow or will turn his train over through going too fast. He has to know exactly the speed at which to take every junction otherwise his train will jump the points and wreck itself. (As happened at Preston about fifteen years ago.)

He has to know his road so that in the dark or in a fog he knows exactly where he is without depending on his signals. And he has to know exactly where the signals are so that in rain or hail or fog he can just catch the necessary glimpse whether the signals are with him or against him.

He has to know by the feel of his train what weight he has got behind him, so as to know where to apply his brakes and where to let her rip. And he has to know from the feel of the rails whether he dare apply his brakes sharply or gently. (Wet rails under a train are just as bad as a greasy road under a car.)

He has to know just what steam he wants to get up certain hills, and he has to watch that his engine is fired accordingly so as to avoid coming into a station with too much fire in his boiler and with pounds of steam blowing off while the train is standing. The skilled driver never trusts his steam and speed gadgets, but goes entirely by the feel of the engine because he knows that his gadgets may go wrong.

If anything should break in the engine, as happens much more frequently than the travelling public know, the driver has got to judge in an instant what has gone wrong and he has got to act accordingly. If he jambs on his brakes all at once he will tear the rails off the sleepers and he has got to make up his mind in an instant whether it is better to do that than it is to let the train run for a mile or two with the broken part hammering around inside the engine, bearing in mind that the broken part may smash up his fire-box and set the train on fire or may smash his boiler pipes and scald him and his mate to death. (An engine-driver and fireman were very badly scalded only a few weeks ago through precisely that cause.)

(C) It is natural that in their youth and ignorance, and because of the way in which they were belauded as heroes during the War, aeroplane pilots should acquire the idea that their personal skill and technical knowledge are necessarily much greater than those of an engine-driver. As a matter of fact they are not. Quite a lot of forced landings occur through the astonishing ignorance of the pilots about quite simple technical things and quite a lot of crashes occur not so much through lack of skill as through lack of judgment. The reliable air-line pilot is not the man who gets out of a tight corner through his extreme skill but the man who never gets into a tight corner.

(D) There is also the point that so far as air-lines are concerned the work of the pilot is never likely to be anything like that of the captain of a ship. Passenger transport by air must be in relation to other methods of transport pretty well what the tube train service is to the main line express.

Foolish people talk gibly of vast air liners carrying one or two hundred passengers. Such people misjudge the great advantage of air transport which is that it makes possible the operation of small high-speed units at frequent intervals. If there be one aeroplane per day from London to Paris or London to Berlin one might almost as well go by the ordinary night train and boat service as adjust one's programme for the day to the starting hour of the one aeroplane.

The thing which will appeal to the travelling public will be that they will take a car down to the aerodrome and go by the next machine, which will certainly start within an hour of their arrival and probably within half an hour. It will be just like going down to a tube station at one's own convenience and catching the next train within three minutes instead of having to adjust the whole of a day's programme in order to catch an express train at a certain stated hour. It is just that advantage which has made the motor-car so popular and has almost killed first-class rail traffic for any distance outside the suburban radius and inside 150 miles.

Under these circumstances it is very unlikely that aeroplanes will ever carry more than 25 passengers. If it be found that there is a very great demand for passages between London and Paris at certain hours of the day then more aeroplanes will be put on during those hours and they will start at ten-minute intervals instead of half-hourly or hourly intervals. For example quite a number of people probably want to travel between London and Paris between 11.00 hours and 15.00 hours and take lunch en route so as to get in a morning's work before starting and have a clear afternoon in Paris, or vice versa. Thus there will probably be a ten-minute service for about three or four hours in the day and an hourly service or half-hourly service in the early morning and in the evening.

(E) The men who intend to be pilots on air lines have got to face the proposition of flying on one route and no other till they retire with an old age pension. They have got to know every field, every tree, every church steeple along the route as well as an engine-driver knows the landmarks of the road over which he drives. They will have observation posts and signal boxes every few miles along the route to tell them what the weather is like ahead and to warn them whether they have got to come down or not. Rather more will be done for them in the way of signalling than is done for an engine-driver and very much more will be done for them than is done for any ship's captain.

One does not pretend that these arguments apply under existing circumstances. But one does say that those are the conditions that have got to be faced by men who intend to become regular air-line pilots.

Men working under conditions where everything will be done for them, even to the getting off and landing of their machines, cannot pretend that they are entitled to wages very much higher than those of a first-class engine-driver. And personally one believes that the engine-driver ought by rights to be the more highly-paid man, because he has much greater responsibility and has to serve a very much longer apprenticeship before being trusted with a first-class express.

There will always be plenty of work for the temperamental war pilot either in pioneering new air lines along unprepared routes or in doing air survey work over unknown country. Also there should be in time quite a good deal of work for air taxi-drivers who will have to take machines across country where there are no prepared air lines, much in the way that a number of very valuable and interesting air tours have been made over the Continent during the last few years.

Pilots on such pioneering work certainly need considerable experience of navigation and much skill in the handling of machines and judgment as to what to do under difficult circumstance. But the regular air-line pilot should give up trying to humbug himself into the belief that he is going to be anything more important than an engine-driver, for he will be lucky if in the course of ten or fifteen years (barring service in the next war) he finds himself in a position more exalted than that of an L.G.O.C. 'bus driver.

These facts may be extremely unpalatable to the gallant temperamental pilots who have done the pioneer work of Civil Aviation in this country but like other uncomfortable facts in life they have to be faced and the sooner the people concerned face them the better.

A SAFETY MATCH.—Here is seen a batch of six Bristol Training machines with 100 h.p. Lucifer engines. These machines are being used by the R.A.F. Reserve training school at Filton and in the course of a year none of these machines has had a forced landing. It seems therefore that the late William Shakespeare's remark "When he falls, he falls like Lucifer" will have to be revised. So far as Bristol trained pilots are concerned training at Bristol seems to be a perpetual safety match.

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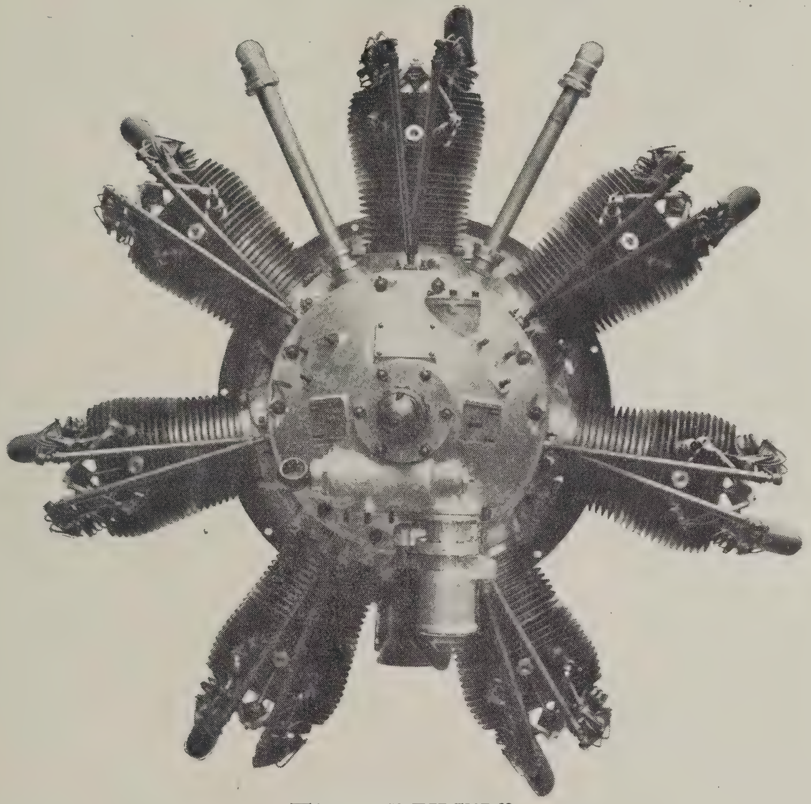

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THE REVIVAL OF AIRSHIPS.

By C. G. GREY.

After much agitation mental, political, financial and temperamental those who have been concerning themselves with and for the progress of airship design, construction and operation have at last the satisfaction of seeing something done after so much attempted. Presumably therefore they felt that (to complete the quotation) they had earned a night's repose on May 14 after the Prime Minister had made his statement in the House of Commons as to the Government's intentions in the matter of airship research and construction.

The statement had been forestalled in *The Times* on the morning of May 14 in an article by that paper's Parliamentary correspondent, whose forecast of the Prime Minister's statement appeared to certain Members in the House to disclose a fore-knowledge which displeased them. *The Times* statement was exceedingly accurate except in saying that the Lord Thomson, Secretary of State for Air, was to make the announcement in the House of Lords. In the event, the statement was made by the Prime Minister in the House of Commons.

As the subject is of very considerable historical interest and of immediate Imperial and International import it seems well to reproduce in full not only Mr. MacDonald's statement but also the discussion and the explanation by Lieut.-Commander Burney which followed. According to the official report in Hansard these were as follows :—

THE PRIME MINISTER'S STATEMENT.

Lieut.-Col. Sir S. Hoare (by Private Notice) asked the Prime Minister whether he could make a statement of the Government's policy in connection with airships ?

The Prime Minister : After careful examination His Majesty's Government have decided to reject the scheme put forward by the Airship Guarantee Company—commonly known as the Burney scheme. In their opinion this scheme would have entailed the creation of a virtual monopoly, and contained a number of other features which are open to objection both on financial and technical grounds. At the same time His Majesty's Government share the view of their predecessors that it is essential to carry into effect as early as possible a constructive programme of airship development.

They propose accordingly to authorise the Air Ministry to initiate forthwith a comprehensive programme of lighter-than-air research and experiment at Cardington, including full scale experiments with one of the existing ships, which will be reconditioned for the purpose, and to undertake the early construction of a new airship of a capacity of 5,000,000 cubic feet.

Further the Air Ministry will undertake the construction of a terminal and an intermediate base overseas, with the necessary facilities to enable these two ships to be operated with safety between England and India.

Simultaneously, the Air Ministry will give the Airship Guarantee Company the first offer of a contract for the construction of a second ship for commercial purposes. It is proposed that this contract shall include a clause under which the constructors will be permitted to re-purchase the ship from the Air Ministry at a reduced figure on completion of satisfactory flying trials, provided—

(1) That it is to be operated in connection with an approved British commercial airship service; and

(2) That it shall be available for use by the State as required.

By these means private initiative will be linked with lighter-than-air development from the start, and, in the event of success, the early inauguration of commercial airship services open to all firms likely to be interested will be facilitated. At the same time this second vessel will provide the nucleus of a reserve of personnel and material. Such a reserve will be essential if, as is hoped, airships prove capable of fulfilling certain important defensive functions—a development from which material economies in other forms of defence expenditure may ultimately result.

These proposals should enable two airships to be placed in commission in a shorter period than under the original scheme, since the Government and commercial vessels will be laid down simultaneously. They will, moreover result in the maintenance of two separate airship manufacturing plants and other ground facilities on a scale which will admit of rapid expansion. Further the valuable existing airship stations at Cardington and Pulham will remain State property instead of passing into private hands, whilst ownership of the new bases to be constructed overseas will also be vested in the State.

As regards the financial aspect, under these proposals it will not be necessary to incur from the outset the very heavy commitments —amounting to a total sum of £4,800,000 over a period of fifteen years—which would be involved by the original scheme.

A three years' programme only will be authorised in the first instance, and no decision will be necessary as to further development until this programme is nearing completion, when much fuller data will be available than at present. It is estimated that, allowing for the re-purchase of the second ship by its constructors, the net expenditure involved in 1924-25, 1925-26, and 1926-27 will not exceed £1,200,000.

A Supplementary Estimate in respect of the sum required for this service in the current year will be laid before the House at an early date. My Noble Friend, the Secretary of State for Air, will make a fuller statement on this subject on Wednesday the 21st inst. in another place.

Sir S. Hoare : Is the Prime Minister aware that the estimate of £4,000,000 which he has just quoted are for six airships and not for two and therefore the figures he has given are not comparable at all. Further whilst obviously we cannot go into details to-day upon this question, will the right hon. Gentleman arrange for the Supplementary Estimate to be taken as early as possible so that we shall have an opportunity of debating the statement which he has just made, without any delay ?

The Prime Minister : I think the latter part of the question is perhaps the more important, namely that the Supplementary Estimate should be put down at an early date. It is quite obviously impossible to discuss this matter or in fact to give very much more information on this matter by question and answer. I should like to say, however, that it is perfectly true that the £4,800,000 was for the construction, as it was hoped, of six airships, all of which would belong to private companies at the end, whereas, our scheme, I think, is much better financially than that. Still that is a matter which will have to be raised on the Supplementary Estimate.

Mr. T. Johnston : Is the Prime Minister aware that the main outline of the scheme he has just read to the House, with details in some instances, appeared in this morning's *Times* and will he explain to the House how these details could be disclosed to the *Times* without first being communicated to this House ?

The Prime Minister : I am very much obliged to my hon. Friend for raising this question My attention has been drawn to this matter this forenoon. I regret it very much, and I am informed that it did not come from the Air Ministry but that it came from some of those with whom naturally we had to be in negotiation in order that we might explain, and have explained to us, the business foundation of any scheme that might be introduced. I think it is a practice which is most reprehensible, and I regret very much that I can take no disciplinary action beyond the announcement that I have just made to the House.

Mr. Lambert : Can the Prime Minister say whether the amount he now suggests to the House is in addition to the Estimates already presented to Parliament ?

The Prime Minister : It is a Supplementary Estimate for quite a new scheme, mainly of commercial importance, but that point also can be debated on the Supplementary Estimate.

Captain Brass : Will the Prime Minster state where this overseas base is to be situated ?

The Prime Minister : I would rather not. I am sure that it is in the public interest that it should not be stated.

Mr. T. Johnston : Can the Prime Minister take no steps as a result of the paragraph in to-day's *Times* which says that an order is to be given forthwith to the Burney group to proceed with the building of an airship capable of doing so-and-so and having regard to the fact that these details have been disclosed to the Press, can he reconsider any decision which has been come to regarding the giving of the contract to any such group ?

The Prime Minister : I do not think I can be more emphatic than I have been in my expression of regret that this has been given away before it has been announced to the House. With reference to the second part of my hon. Friend's question, we are absolutely free to enter into negotiations with any company or any group and, if that were advisable and wise, to open new negotiations. The Government are not tied in any way, and are not prevented by any agreement from doing so.

Viscount Curzon : As the Prime Minister has made a very serious allegation, presumably against the Burney group, can he give the House some indication as to how he makes such an allegation, and what foundation there is for it ?

The Prime Minister : I have made no allegation against the Burney group. We have been in negotiation, and we have discussed the finance of the matter and the technicalities of the matter with various experts. I say that I was so gravely concerned with what I saw when my attention was drawn to this publication in the *Times* of this morning that I asked whether steps had been taken to ascertain where the leakage came from, and the information I had was that it did not come from the Air Ministry or from our side, and therefore it must have come from one or other of the persons with whom we have consulted in confidence about the scheme.

Mr. J. Jones : Will the Prime Minister consider the fact that one of the principal members of the firm included in this charge is a Member of this House ?

Lieut.-Commander Burney : As this question has been raised I think it would be as well if I gave an explanation. I gave certain information to one of the Lobby correspondents last night, but I did not give any information other than that which had already been published in the *Westminster Gazette* nearly a week before and had already been published in the *Daily Mail* some three or four days before. I took up the matter with the Under Secretary of State for Air and asked that some means should be taken to stop this leakage as it would appear to come either from myself or some other person who had been negotiating in the matter. That information had been given out to the Press and I think hon. Members will find, if they read this article, that the only other information is information directly dealing with private work which is going on in a private concern and has nothing to do with the secrets of the Cabinet Committee.

I think they will also find, if they read the *Daily News*—I think it is the *Daily News* of the day after the publication in the *Westminster Gazette*—that I was interviewed by reporters as to my views on that statement and as to whether it was correct or otherwise and I refused to give any information because I had been a party to these Cabinet conferences. As I say, yesterday I only repeated what had already been published in the papers a week or more ago, and I did not think in these circumstances that I was in any way abrogating a confidence.

I would like to say further that I informed the Air Ministry this morning directly this was published, as I did not expect it to be published until to-morrow. (Hon. Members : Oh ! Oh !) I think it is quite obvious that I should not have done so if I had thought that it would inconvenience the Prime Minister in his statement to-day. I informed the Secretary of State for Air this morning that I had given this information, and that I was sorry that certain portions had been put in which had already been published by the

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Westminster Gazette, and which therefore would appear as having more authority than otherwise. I think that is an explanation which will satisfy the House.

FORMER REASONS AGAINST AIRSHIPS.

It is now proper to express the opinion that it is a good thing that this country should begin once more the design and construction of airships. The airship people in the Air Force have always regarded THE AEROPLANE as being hostile to airships, partly because they have imagined that because of its name this paper is concerned entirely with heavier-than-air craft and partly because the airship people have been criticised in this paper. The reason for these criticisms was that our airship affairs were handled in such a curiously chaotic fashion that adverse criticism was necessary.

During the War 1914-18 it did not seem that big airships could serve any useful purpose, and after the War when all expenditure on aeronautical material was cut down to an irreducible minimum there was not enough money for the development of aeroplanes and therefore there was no money at all to spare for airships. Consequently one was invariably against those people who continually cried out for money to be spent on big rigid airships.

Furthermore, America was spending money on experimental rigid airships. France was experimenting with a big airship acquired from Germany. And the Zeppelin Works at Friedrichshafen had been building a ship of the most modern type for delivery to America under the reparation clauses of the Versailles Treaty. That being so it seemed that the best policy for England was to do nothing with rigid airships but to wait and see what happened to those experimented by other countries so that we might learn useful lessons from them.

Our own unfortunate R.38 broke in the air and killed a number of useful people. The French lost their acquired Zeppelin. And an accident happened to the American-built rigid airship which would have caused her total loss but for the skill of a German Zeppelin pilot who was on board at the time. If our airship designers have studied all the possible causes of all those mishaps and have profited by them it would seem that our period of inactivity has been well worth while. It should now be possible for us to begin where the other designs have ceased.

Strenuous efforts have been made since 1918 by interested persons to jockey the Governments of the period into spending money on reconditioning and putting into use for experimental purposes a couple of wartime airships which still exist in a more or less advanced state of decay and efforts were also made to induce the said Government to complete a partly finished twin ship of R.38. By good fortune or by good judgment all these efforts failed and we can now start with a clean sheet and one hopes with vastly increased knowledge of airship construction.

A SOUND SCHEME.

The scheme as laid down by Mr. MacDonald seems eminently sensible. Under it two rigid airships of the largest size are to be built. One is to be built at the Government Aircraft Factory (formerly Short Brothers' Works) at Cardington from which place the Lord Thomson takes his title, though it would seem there is no connection between his peerage and the airship industry. The other is to be built by the Airship Guarantee Company which is a corporation, syndicate, firm, or whatnot, which is prepared to back Lieut.-Commdr. Burney's original scheme.

It will be noticed that Mr. MacDonald said that the Airship Guarantee Company were to have the first offer of a contract for the construction of this second ship and it may be assumed that this offer will be accepted by the firm, in which it is understood that Vickers Ltd. are the predominant influence.

It strikes one that the Government's offer is eminently fair, in that the order will be a definite order for the delivery of an airship and that if the ship proves satisfactory during its trials the Airship Guarantee Company will have the option of buying the ship back again from the Government at a reduced figure so that they may operate it on an approved British commercial airship service.

SOCIALISM VERSUS CAPITALISM.

Thus we have definite competition between a Government airship dockyard and a purely commercial undertaking. And so we shall have a fair chance of judging whether the socialist idea of building aircraft in a Government dockyard can compete with private enterprise. Socialism and Capitalism will be placed in fair competition and Capitalism will have the additional inducement that having expended its capital it will be able to re-acquire its own product at a distinct profit. It would be hard to imagine a fairer method of proving the merits of the two systems.

Apparently the original Burney scheme would have involved the nation in an expenditure of £4,800,000 spread over a period of fifteen years—an amount very considerably in excess of that allocated to the development of air lines by Imperial Airways Ltd. and the operation of aeroplanes on those lines. According to the new scheme it is estimated that the net expenditure will not exceed £1,200,000 in three years. Even this will considerably exceed the cost to the nation of subsidising Imperial Airways Ltd. in that the airship scheme will cost £400,000 per annum whereas Imperial Airways are only allocated £100,000 per annum.

Here again we shall have a fair opportunity of testing not only the usefulness of airships but the ability of the people responsible for the development of airships for at the end of three years we shall be able to see just how much Imperial Airways and its aeroplanes have done for £100,000 a year as compared with the Airship Guarantee Company and the Government combined with their £400,000 per annum.

The absolute fairness of the Government in this matter is shown by the fact that the cost of the airships is to be paid out of a Supplementary Estimate and is not to be extracted from money already voted for the Air Ministry.

FLYING VERSUS FLOATING.

It will be extremely interesting to watch in the course of the next few years the two simultaneous competitions, airships versus aeroplanes and Socialism versus Capitalism. There seems to be some curious law of nature which decrees that the fastest possible airship at any given period shall have about half the speed of the fastest possible contemporary aeroplane. At the moment the aeroplane is some little way ahead because it is already doing 260 miles an hour and it will be some time before an airship can be pushed up to 130 miles an hour. Nevertheless the cruising speed of a good airship is now roughly 60 miles an hour whereas the cruising speed of a good modern aeroplane is only about 120 m.p.h.

But if one reckons an average speed over the ground on a long journey it will probably be found that the aeroplane is still about twice as fast as the airship. That is to say if on a voyage to India the two vehicles meet a 40-mile-an-hour head wind the speed of the airship over the ground would be reduced to 20 miles an hour and the speed of the aeroplane would be reduced to 80 miles an hour, although it would still have four times the speed of the airship.

On the other hand the airship can drive ahead steadily through the night and we have not yet reached the stage when the ground organisation of our air lines is such as to permit aeroplanes to travel by night. Consequently at the end of a 24-hour run the airship would be very little behind the aeroplane in average weather.

There is however very much more development work to be done on airships before they can be regarded as reasonably reliable safe passenger vehicles than there is on aeroplanes. This is only natural, because airships like elephants breed slowly. At the rate of progress since the late and ever-to-be-honoured Count Zeppelin constructed his first rigid ship there have been in reality only some eight or ten distinct generations of airships whereas there have been probably ten times as many generations of aeroplanes in the process of evolution. Therefore it is fair to suppose that in relation to the ultimately-to-be-developed airship the rigid ship of to-day is in much the same stage of evolution as was let us say the 80 h.p. Gnome-engined biplane of 1913.

It would be unfair therefore to compare the high percentage of crashes in airships per mile covered with the comparatively low percentage of aeroplane crashes. We must give the airship a good many years in which to develop before it will be fair to make any comparison between the safety of floating and the safety of flying through the air. We already know how to make an aeroplane almost immune against serious accidents but we are still a long way from being able to claim such for airships. For this reason it will be well if all readers of these notes make a point of impressing on their friends that the airships which are to be built are purely experiments, so that if either or both come to a bad end people may not for that reason condemn all airships.

Optimists no doubt believe that as soon as the two ships are out of their sheds it will be possible to start with them a non-stop mail service to India and a non-stop extension thence to Australia. It will be well to disabuse everybody's mind of any such illusions. Even supposing that the ships themselves prove to be free from serious defects it must be necessary to experiment with them for at least a year before all their minor peculiarities have been discovered and before we can have crews capable of working them on a long journey.

CASSANDRA'S VIEWS.

One is inspired to a certain amount of faith in the future success of the new scheme by the attitude of that excellent paper *The Morning Post* which manages to be wrong in its views on aeronautical affairs with a regularity which makes it at least as trustworthy as is a good barometer. The Political Correspondent of *The Morning Post* says that " the plan is not likely to commend itself

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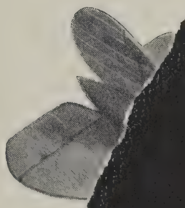
AEROPLANES

Designers and
Aircraft f



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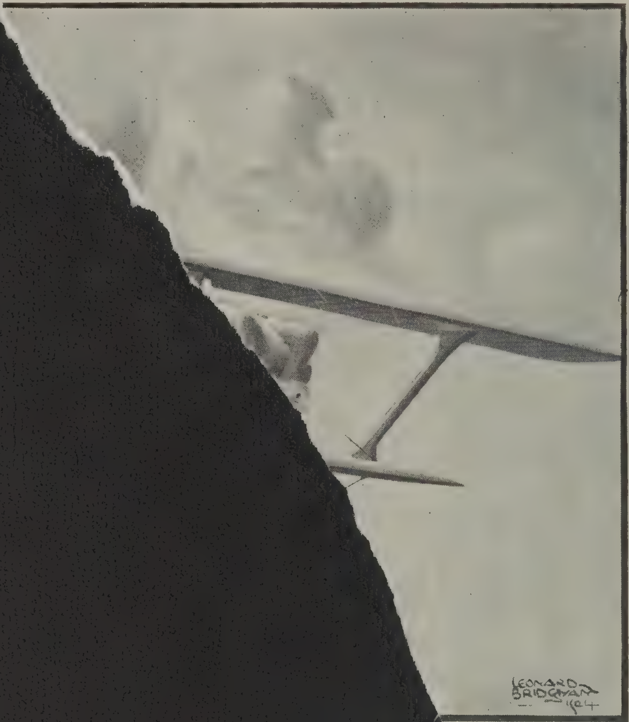

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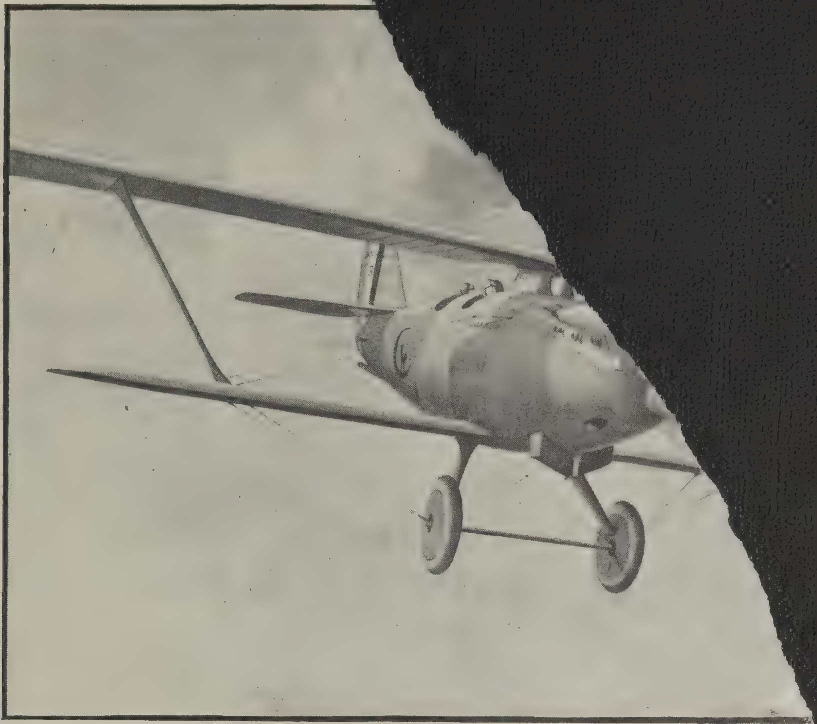

THE AIR EXPRESS.—A drawing by Mr. Leonard Bridgman of the Breguêt XIX A2 (360 h.p. which Lieut. Pelletier D'Oisy is making his flight from Paris to Tokyo. This machine is a sta taken from stock and the amazing progress is largely due to the ability of the machine to cr

to business Members or to those who are anxious for the rapid development of airship communications throughout the Empire." That alone is hopeful. The business Member of Parliament is always the very worst judge of anything of technical or warlike import and those who are anxious for the rapid development of airship communication are of the type of young man in a hurry who invariably meets with disaster.

The Morning Post also says that the Air Ministry has no facilities for and no experience in the construction of airships. The truth is that the Works at Cardington are the newest and best yet constructed in this country for airship work.

It is very probable that the *Post* is right in saying "there will be inevitable delay in starting and like all Government enterprises the work once commenced will be hindered by suggestions from this expert and that for new features or fancied improvement." That statement is equally true of whatever work may be done by the Airship Guarantee Company. Both ships will have to be built under Air Ministry supervision and short of a sudden fatal epidemic in the Air Ministry one fails to see anything which can prevent interference with the airships by precisely the same gang of self-appointed "experts" who have so successfully ruined the performance and hindered the output of every British aeroplane.

Lastly in its best Cassandra manner *The Morning Post* says "Then again there may be reopening of the old disputes between the Air Ministry and the Admiralty." Which means of course that the Admiralty assisted by *The Morning Post* will claim that the airships shall be manned and operated by naval personnel. It is true that airships may conceivably be of use in some future war at sea, but one scarcely sees how any possible airship is likely to be able to escape from or defend itself against attacks by high-s aeroplanes.

Perhaps the argument which would weig officers against the handing over of airs is that unlike sea ships the blunt end of first and the sharp end follows it and that ship is underneath. One feels sure that would hate to have to look at his ship from see the sharp end following him. It would preconceived notions of the Nelson period w nate the Navy.

THE USE OF AIRSHIPS.

It is at any rate fairly certain that airships any very material use in any land war of th in the real World war, in which more and m intelligence are beginning to believe, it is prol ships will be extremely useful for the conve portant people in the quickest possible way fro the World to the other, provided that the route have to follow are known to be free from hostil Thus officers of the American and European conveyed across the Atlantic from one Hemis other and it should be possible by means of airsh rapid conveyance of military chiefs between L and Berlin in the West and Baghdad, Singapo Port Darwin in the East.

In the meantime if these ships prove to be should be possible to use them and their imme sors within the next five years for regular pos tween the extremes of the British Empire. That assuming that after Mr. MacDonald and Mr. Sn achieved their apparent objects the various com of the British Empire, as we now understand it, speaking terms.

The King's Cup.

The report from the Joint Standing Committee of the R.Ae.C. and S.B.A.C. has been considered by the Racing Committee of the Royal Aero Club together with correspondence from the S.B.A.C. It was decided to recommend that the Race round England should be confined to one day only and that it should be open to all types of aircraft.

Aerial Derby.

The regulations for the Aerial Derby to be hel on August Bank Holiday, August 4th, 1924, ha approved by the committee of the Royal Aero C

It was decided to hold a Handicap for planes with engines limited to 1,100 cc. at Ly same day for prizes amounting to £125.

ETAL

AND SEAPLANES.

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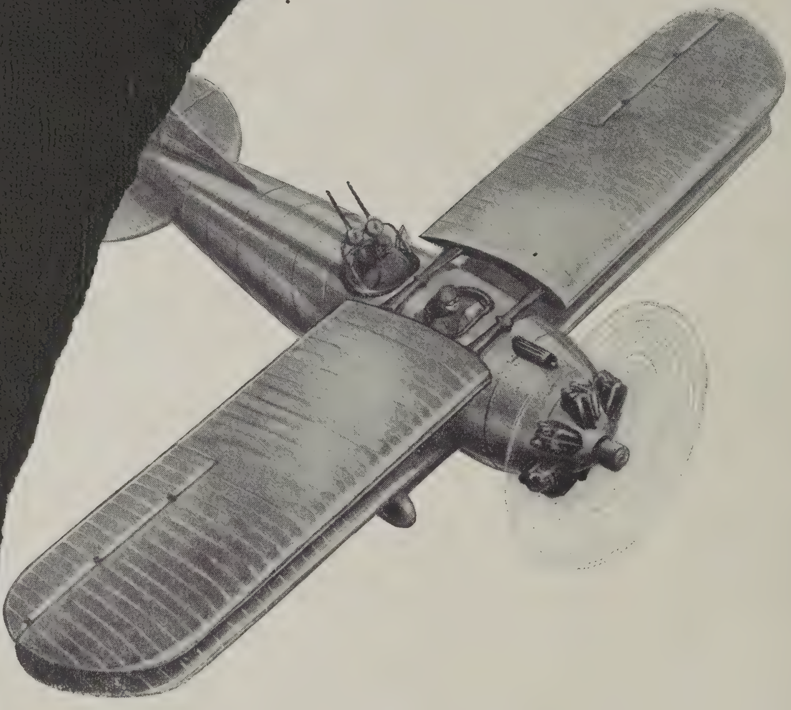
r the British Government.



As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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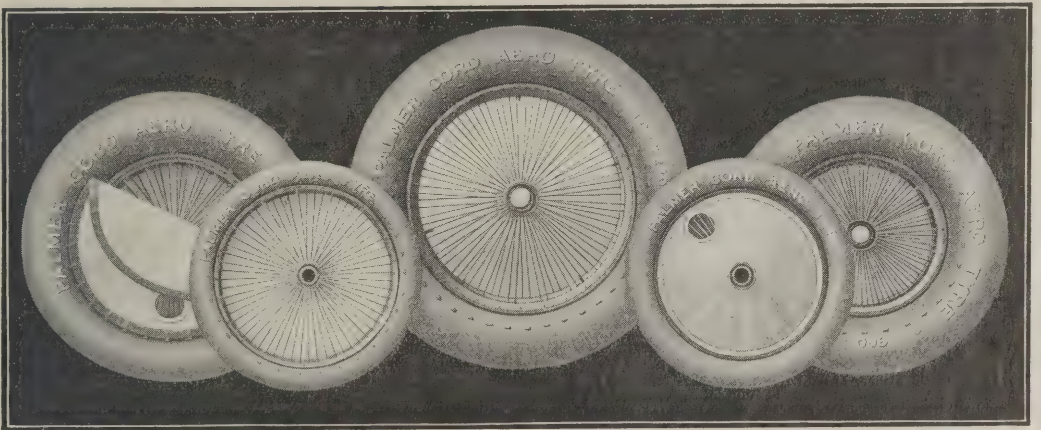

STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
"	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
"	138	130.	38.09	Central
575×60	21	160.	28.	Central
"	34	150.	31.75	104/46
"	111	150.	38.09	104/46
600×75	21	160.	28.	Central
"	34	150.	31.75	104/46
"	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	96	178.	55.	132/46
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
650×125	119	178.	55.	132/46
"	147	178.	55.	Central
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	96	178.	55.	132/46
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
800×150	82	185.	55.	135/50
"	85	185.	55.	Central
"	161*	185.	55.	135/50
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
"	150	185.	55.	Central
"	167	185.	55.	125/60
"	174	250.	80.	Central

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	201	185.	60.32	125/60
"	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900×230	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 161, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.*
†Wheel No. 169 is fitted with Ball Bearings.

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S/NK (240)

THE ROYAL AIR FORCE.

The London Gazette.

May 13.

General Duties Branch.—Flt. Lt. C. Boumphrey, D.F.C., is granted a perm. commn. in the rank stated (May 14); R. S. Barbour is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, May 1; Flt. Lt. L. J. Killmayer, M.B.E., is placed on the retired list (May 14); Sq. Ldr. R. Hutton is transferred to the Reserve, Class C (May 16).

Medical Branch.—Flt. Lt. W. D Miller, M.B., is transferred to Res., Class D.2 (May 15).

Reserve of Air Force Officers.—The follg. Officers are confirmed in rank. with effect from dates indicated :— Flg. Offs.—F. W. Knox (Nov. 8. 1923); J. W. Thompson (Apr. 16); J. S. Stubbs, D.F.C. (Apr. 18); J. P. Morkham, D.F.C. (Apr. 23); L. A. Lewis (May 13); Plt. Offs. A. E. Roberts (Apr. 8); H. J. L. Jones (Apr. 12); E. A. Burbidge (Apr. 17); E. J. Wing (Apr. 18); W. A. Rollason (May 5); H. H. Perry (May 6). Obs. Off. F. W. Brown is transferred from Class B to Class C (Feb. 17); Flg. Off C. B. J. Lancaster resigns his commn. (Mar. 4).

Appointments.

Week ending May 19.

General Duties Branch.—Wing Commander G. R. Bromet, D.S.O., O.B.E., to H.Q., Mediterranean, for Air Staff duties with C. in C., Mediterranean Fleet, 9/5.

Flight Lieutenants D. W. King, to H.Q., Iraq, 26/3; H. G. R. Malet, to R.A.F. Base, Gosport (No. 420 Flight), 17/4; O. R. Gayford, D.F.C., to No. 29 Sqdn., Duxford, 22/5; J. E. B. B. Maclean, D.S.C., and A L. Russell, to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab., 24/4; E. P. Hardman, D.F.C., to No. 1 F.T.S., Netheravon, 16/5.

Flying Officers L. A. W. Deane, to No. 99 Sqdn., Bircham Newton, 3/6; E. H. Rundle, to No. 2 F.T.S., Duxford, 22/5; D. S. Cairnes, to No. 111 Sqdn., Duxford, 10/5; C. W. Dann, M.C., to School of Army Co-operation, Old Sarum, 19/5; J. de la P. B. Preston, to Station Commandant, Iraq, 26/4; C. Sutton, to Basrah Group H.Q., 28/4.

Pilot Officer F. S. Henderson, to No. 30 Sqdn., Iraq, 9/4; T. W. G. Cattell, to No. 29 Sqdn., Duxford, 16/5.

Medical Branch.—Flight Lieutenants (Medical) J. C. Osborne, M.B., to Baghdad Combined Hospital, Iraq, 23/4; J. Prendergast, M.B., B.A., to Aircraft Depot, Iraq, 19/2; J. D. Leahy, M.C., M.B., B.A., to Aircraft Depot India, 15/4: A. E. Jenkins, to No. 12 Sqdn., Andover, 1/4. Flying Officers (Medical) T. Glynn, M.B., to R.A.F. Base, Leuchars, 2/5; R. L. C. Fisher, M.B., to R.A.F. Depot, 19/5; G. P. O'Connell, M.B., to R.A.F. Depot, 15/5; F. K. Wilson, M.B., to Basrah Combined Hospital, Iraq, 11/4; T. V. O'Brien, M.B., to H.Q., Egypt, 9/5.

Stores Branch.—Flight Lieutenants (Stores) W. Sutherland, M.B.E., to No. 1 School of T.T. (Boys), Halton, 20/5; A. Garrity, to Air Ministry, 3/6. Flying Officers (Stores) R. Craig, to No. 5 F.T.S., Shotwick, 3/6; H. F. Webb, to No. 5 F.T.S., Shotwick, 26/5; E. F. Elliott, to No. 13 Sqdn., Andover, 26/5; J. H. P. Clarke, to No. 31 Sqdn., India, 15/3; F. A. R. Smith, to No. 5 Sqdn., India, 15/3. Flying Officer (Accountant) F. M. Gingold, M.B.E., to H.Q., Egypt, 25/4.

The State Ball.

Invitations to attend the State Ball at Buckingham Palace on May 14 were issued to the following officers of the R.A.F.. some of whom were unable to obey Their Majesties' Command :—

Air Chief Marshal Sir Hugh Trenchard.
Air Marshal Sir John Salmond.
Air Vice-Marshals Sir Vyell Vyvyan, P. W. Game, Sir Ivo Vesey and H. R. M. Brooke-Popham.
Air Commodores C. L. Lambe, J. M. Steel, C. A. H. Longcroft, L E. O. Charlton, and D. le G. Pitcher.
Group Captains J. F. Forbes and C. L. Kilner.
Squadron Leader R. M. Drummond.
Flight Lieutenants E. J. P. Burling, W. F. Dickson, R. E. Meek, H. M. Massey and C. H. Stilwell.

The Royal Air Force Pageant.

The Air Ministry announces :—

> The fifth Royal Air Force Aerial Pageant will take place at the London Aerodrome, Hendon, on Sat. June 28. It is hoped that some of the members of the Royal Family will be present.
>
> Instituted in 1920, the Pageant now forms an integral and important part of the annual training of the Air Force, and provides a valuable stimulus to keenness and efficiency in the many squadrons taking part in the flying displays.
>
> The programme has been devised to show in an interesting form the many sided activities of the R.A.F. and to illustrate the progress which has been achieved in the technical development of aircraft. This year, owing to the growth of the Air Force on the home defence and naval sides, it has been found possible to introduce new features which should make the display more comprehensive and attractive.
>
> Space limitations make it impossible to illustrate fully the work of the flying service either at the British Empire Exhibition or at the Royal Tournament, and it is at the Aerial Pageant that the public at home and visitors from the Dominions are afforded the opportunity of observing at first hand the progress of service flying since the conclusion of the War.

To which one may add that it is hoped on the best authority than an escadrille of the French Service d'Aviation Militaire will be our honoured guests at the Pageant. It is rumoured that the famous No. 2 Escadrille from Nancy will be sent by the French Army.

The visit has no doubt been arranged as a return for that of the R.A.F. Mission under Air Vice-Marshal Brooke-Popham. It will be of particular interest because the machines of the French escadrille are between ten and twenty miles an hour faster than those of any R.A.F. squadron of the same species.

Incidentally, for conversational purposes it is well to note that a French escadrille consists of eight or ten machines and so cannot be compared with a British squadron, which at war establishment consists of eighteen machines divided into three flights of six machines each. Consequently any comparison between the French and British Flying Services on a basis of escadrilles and squadrons is entirely misleading.

Naturally everything will be done to give our French visitors a good time, and presumably they will be asked to the annual gathering of the R.A.F. Dinner Club on the night before the Pageant. May the meeting of the French and British pilots be a happy omen for their co-operation in the next war.

Flying in India.

From information received it would seem that flying in India is becoming more of an accomplished fact in so far as the R.A.F. is concerned.

Of all the General Service Officers in India there are not more than five or six who do not fly, including all ranks. The following cutting from *The Pioneer* concerns two H.Q. Staff Officers who spend nearly all their time on office seats in Delhi or Simla, which shows that when they do get loose they are not afraid to do a job of piloting to keep their hand in.

> The possibilities of flight in India have been further illustrated by a recent tour of a staff officer of the Royal Air Force. It was intended to start the flight from Karachi, but the officer missed the mail train at Lahore and endeavoured to pick it up at Montgomery by flying in a machine borrowed from the Lahore squadron. The train, however, beat the aeroplane by three minutes and so the officer re-ascended and arrived at Khanpur in good time to board the mail. His flight from Karachi took him to Quetta, then by way of Fort Sandeman to Dera Ismail Khan, whence he flew direct to Dardoni through the heart of Waziristan. He visited Razmak from Dardoni by road, and finding the landing arrangements well advanced he pronounced the Razmak plateau to be accessible from the air, with the result that a few days later a machine flew from Dardoni and established the air link between that important Air Force station and Razmak. From Dardoni the staff officer flew to Risalpur, thence to Hassan Abdul, where military training operations were in progress, and back again to Risalpur. The flight had been so successful that it was decided to proceed to Lahore by air, and the officer arrived at the Punjab capital in the same way that he had left it, completing an almost circular air route of about 1,800 miles. Another good performance was that of a brother officer who made a non-stop flight of 900 miles from Karachi to a selected station in the Punjab.

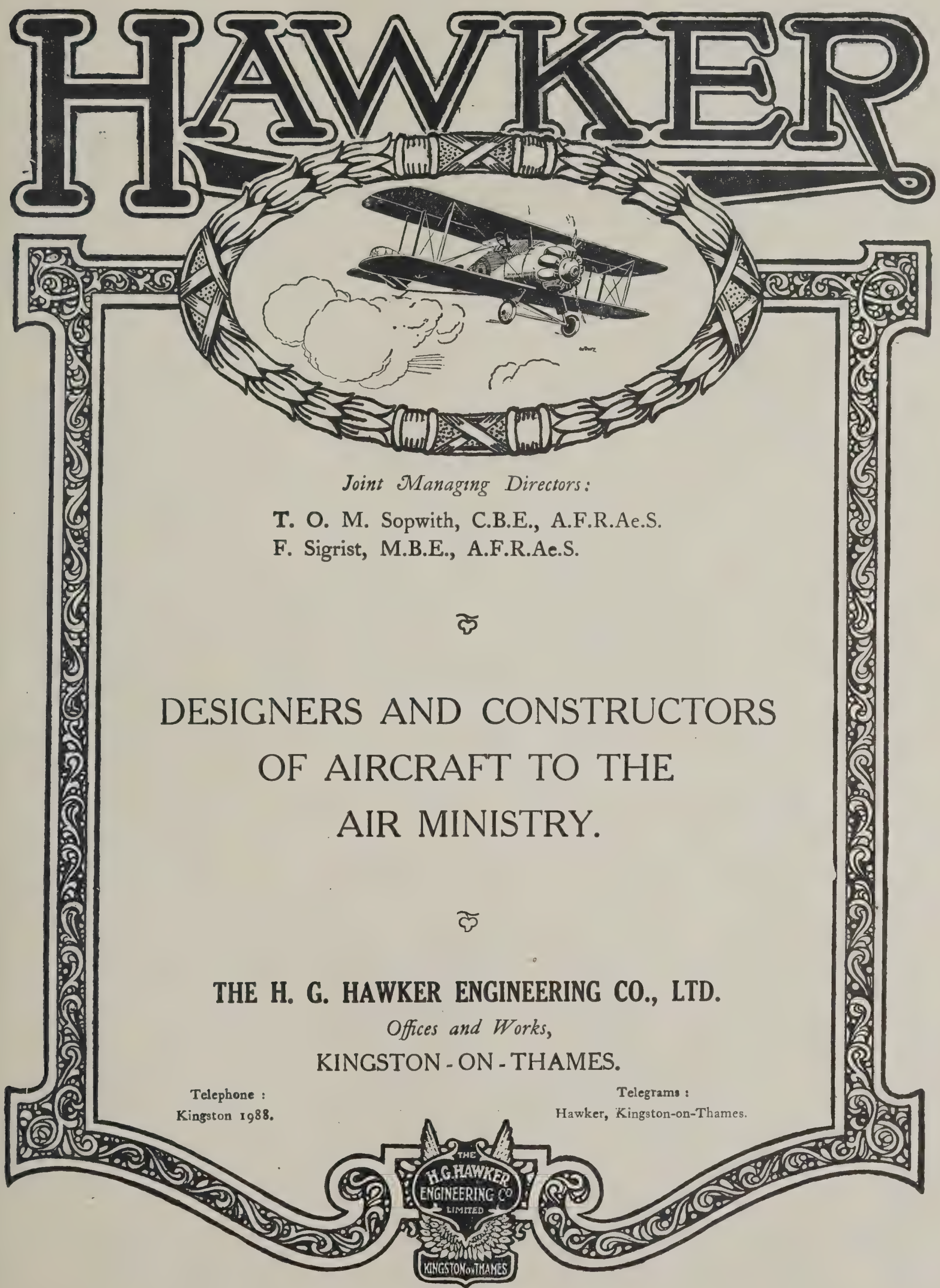
The Canadian Liaison Officer.

It is reported that Wing Commander W. G. Barker, V.C., D.S.O., M.C., recently commanding the Royal Canadian Air Force at Camp Bordon, will sail for England on June 4 to act as Canadian liaison officer with the Royal Air Force.

The Operations in Waziristan.

In his report on the operations in Waziristan for the period Jan. 1 1922 to April 20 1923, General Lord Rawlinson of Trent, G.C.B., G.C.V.O., K.C.M.G., A.D.C., Commander-in-Chief in India, describing the general situation in the beginning of 1922 makes many references to the Royal Air Force. These occur in the following paragraphs :—

> 4. To take the Mahsuds first—as a reprisal for several minor attacks on our troops by Jalal Khel gangs during January and February 1922 the encampments of this section near Saruna were bombed by aeroplanes on Mar. 12; in retaliation for a raid on a convoy in the Takhi Zam on July 1 a settlement of the same section at Gurgura Punja was destroyed by Khassadars, and punitive fines were levied for complicity and territorial responsibility on the Nazar and Shaman Khel; and an attack on one of the Ladha piquets by the Abdur Rahman Khel on July 29 was followed by bombing operations against their villages, in the Upper Baddar Toi, the result being full compliance with the punitive terms imposed by Government. . . .
>
> 5. To turn to the Wazirs. On Mar. 11 the Zilli Khel attacked and captured a Khassadar convoy near Kajuri Kach. This success led to a recrudescence of activity on the part of the hostile elements among the Wana Wazirs, who assembled a lashkar and on Apr. 4 surrounded the Khassadars in Wana Fort. Bombing operations carried out by the Royal Air Force on the 7th, 8th and 11th dispersed the lashkar, inflicted considerable damage on hostile villages near Wana and restored the situation.
>
> 8. Early in September the Government of India obtained sanction to the scheme for the permanent control of Waziristan.
>
> 11. On Nov. 23, Government ordered the suspension of work on the Sorarogha-Rasmak and Jandola-Sarwakai roads, and on Dec. 1 directed that the survey of the former should not be continued beyond Dwa Toi. These decisions undoubtedly increased the belief, already widespread among the Mahsuds, that the occupation of Rasmak would not take place.
>
> 12. The use of aeroplanes at this period might have been of great assistance, but unfortunately they were not available, for various reasons, until Dec. 17. In the meantime it had been found necessary to postpone the advance of the Razmak Force, from Asad Khel, from Dec. 1 to Dec. 15, and it was decided to bomb heavily all hostile sections of the Mahsuds for one month prior to the commencement of the advance.
>
> 13. On Dec. 17, intensive bombing operations commenced against the hostile Mahsud sections, a squadron of Heavy Bombers and one of Bristol Fighters being placed at the disposal of the General Officer Commanding the Waziristan Force for the purpose, and were carried on almost continuously, in spite of bad flying weather, for the next six weeks. On two occasions aeroplanes came down in hostile territory,



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and the airmen fell into enemy hands. Their capture caused much embarrassment to the General Officer Commanding the Waziristan Force in his conduct of the operations, but political negotiations secured their comparatively early release.

22. The destruction of Makin commenced on the 6th. Both Brigades took part in the operation and three villages were successfuly destroyed, but the enemy vigorously pressed the retirement to camp, and our casualties amounted to 28, of which the majority were in the 1-9th Gurkha Rifles.

31. The work of destruction was continued on the 10th. The village of Tora Tiza was demolished, but, taking advantage of the broken and scrub-covered hills surrounding it, several parties of the enemy were able to approach unseen, and delivered determined assaults on the 2-39th Royal Garhwal Rifles; they were, however, beaten off with considerable loss. During the day the 6-inch howitzers with aeroplane observation, shelled the almost inaccessible Abdullai refuge at Mandesh.

32. The next day the troops were given a rest, while the artillery bombarded hostile villages within range. The only portion of Makin now remaining to be destroyed lay within the difficult defile of the Darra Toi, an advance into which would probably have entailed severe casualties. It was therefore decided to deal with it by means of artillery fire and aerial bombing. This was successfully accomplished on the 12th, three pack batteries, the 6-inch howitzers, and the squadron of Heavy Bombers all operating in conjunction.

This completed the devastation of the Makin area, and, in addition to the material damage inflicted, the enemy are known to have suffered over 60 casualties in the course of the operations.

33. During the latter half of February 1923 the situation in the Wana area was adversely affected by the activities of anti-British elements; a hostile lashkar assembled and the Scouts were twice attacked, on the second occasion suffering 11 casualties. In retaliation, three bombing raids were carried out over the area west of Wana and two over the settlements of the Shakai Wazirs, and on Mar. 9 the Scouts moved out of Wana and destroyed the village of Payo Khan Kot.

39. The period under review has afforded opportunities of gaining further experience in the employment of aeroplanes on the frontier. In addition to their value when working in co-operation with ground troops, aeroplanes have been used for independent action on several occasions, notably in dispersing the hostile Wazir lashkars surrounding Wana Fort, and in operating against certain small but troublesome sub-sections of the Mahsud tribes in connection with minor outrages in the spring and summer of 1922. It should be observed, however, that results accruing from the threats against Wana Fort were more moral than material, and that the sub-sections of the Mahsuds were not backed by the support of their own main tribal sections. On the other hand, in spite of the Khassadar garrison of Wana Fort having been reinforced by 500 Scouts, it was found necessary to withdraw the garrison owing to the impossibility of ensuring adequate support by air action whilst, to ensure the successful withdrawal of the garrison, a regular force of some strength had to be sent to Wana. Again, independent action by aeroplanes against the hostile Mahsud sections prior to the ground operations in the Makin area failed to bring about a settlement with the sections concerned

The experiences are in no way conclusive; the available strength in aircraft was inadequate to deal effectively with so wide an area and at the same time undertake close co-operation with the troops. No definite deductions can therefore be drawn. As far as our limited experiences go, however, they indicate that in the light of our present knowledge it would be unwise to withdraw ground troops and trust only to air control until we have larger number of aeroplanes available and further proof of their efficiency in controlling the wild tribes of the frontier.

40. I wish to pay a special tribute to the admirable work of the Royal Air Force. They have been continuously employed whenever weather conditions rendered flying possible and have cheerfully accepted the serious risks of flying over a mountainous and savage country. Both officers and mechanics have throughout displayed a very gallant spirit and a fine devotion to duty worthy of the highest praise.

APPENDIX 2:—RAZMAK FIELD ORDER OF BATTLE.—*Royal Air Force*—No. 27 Squadron (Bombers); No. 28 Squadron (Bristol Fighters).

Royal Air Force Ground Establishments—Camps for Nos. 27 and 28 Squadrons, Royal Air Force at Dardoni and Tank, each Camp sufficient for 2 Squadrons

R.A.F. M.S. versus Phlebotomi.

Report on the Health of the Royal Air Force for the year 1922. (H.M. Stationery Office. 3s. net.)

Air Commodore D. Munro in submitting his report for the year 1922 calls special attention to the valuable research work on sand-fly fever which was carried out at Malta and Baghdad during the year. The R.A.F. Sandfly Fever Commission started its investigations in 1921 in Malta where a close study was made of the habits of the Phlebotomus which is the technical term for the sand-fly and some valuable results were obtained. The importance of this research is shown by the fact that in Iraq alone sandfly-fever accounted for nearly one-half of the sickness.

There was an all-round reduction of sickness in India during 1922 but an increase in Iraq. The ratio of sick daily per thousand of strength for the total abroad shows a reduction.

In the United Kingdom the case incidence per thousand of strength of fresh admissions, deaths, number of sick daily and average duration of each case all show a reduction. There were 40 cases of scarlet fever at Cranwell and 32 cases of gastro-enteritis amongst a section of boys at Halton.

There were 58 fresh cases of functional nervous disorders among officers, 39 at home and 19 abroad. This gives a relatively higher incidence abroad.

Flying casualties, all ranks, number 102 of which 50 were fatal. Four deaths and one case of invaliding occurred in aerial operations, two on the Indian Frontier, one in Iraq, one in Ireland and one in Palestine. There was one death and 14 injuries resulting from personal conflicts and 5 cases of suicide. Accidents due to athletics numbered 611 resulting in one death.

The total number of surgical operations in 1922 was 1,496 of which 957 were performed in R.A.F. hospitals and sick quarters.

Grain, Eastchurch and Martlesham.

"Our Quarterly Journal" was started by the R.A.F. Unit at Isle-of-Grain two and a-half years ago, and twelve months ago East church news was included in the magazine. The Marine Aircraft Experimental Establishment having moved to Felixstowe "Our Quarterly Journal" moved with them and Martlesham Heath has been invited to join in and share the Journal. The May issue which is No. 10, Vol. 3, is worthy of the oldest established R.A.F. magazine and includes news and photographs from all three stations.

"Wind Up!" is an amusing and original collection of the most scared moments in their lives told by various anonymous officers serving with the three units.

Other interesting articles are on Forecasting the Weather by Clouds, Felixstowe War Exploits and The Passing of Grain.

There is a good photograph of the Atalanta, one of the Porte Baby and one of the Felixstowe Fury.

The Halton Magazine.

"The Halton Magazine" is to be published at the end of each term and the first number has now appeared. Practically all the contributions are by the Aircraft Apprentices themselves and the Editor is to be congratulated on the magazine which is well arranged and illustrated. It is instructive without being in the least dull and deals with every form of work and amusement on the Station.

The sports section shows that the standard of boxing is very high. There are seven Rugby teams. The Station Hockey Team has played 15 matches and won 10. The Association football first XI have played eight matches and won five and in cross-country running Halton won the R.A.F. Championship with a total of 90 points.

In addition to the reading room and reference library there is a lending library which is managed by a committee of Aircraft Apprentices.

A series of articles of interest to the senior boys begins with one on the R.A.F. in India illustrated with photographs.

The notes on training and workshops are extremely interesting perhaps more so to outsiders than to those for whom the "Halton Magazine" is primarily produced.

The Dunkerque Dinner.

It is proposed to hold the annual dinner of the R.N.A.S., Dunkerque, and 5th Group, R.A.F., at the R.A.F. Club on Wed., June 25, at 7.30 p.m.

Air Commodore C. L. Lambe, C.B., C.M.G., D.S.O., will take the chair.

Will those officers who wish to attend kindly communicate with the above-named officer, Halton Camp, Bucks.

The price of the dinner will be 12s. 6d. per head.

Japanese Awards.

The following awards have been made by the Emperor of Japan:—

ORDER OF THE RISING SUN (JAPAN) (FIFTH CLASS).—Capt. W. F. Jones (late R.A.F.). SIXTH CLASS.—Mr. R. M. Brutnell, Serjeant Mechanic (late R.A.F.).

The Flight Round Australia.

Wing Commander S. J. Goble, D.S.O., O.B.E., D.S.C., and F/O. I. E. McIntyre, A.F.C., R.A.A.F., who have now flown round Australia, flew across the Great Australian Bight from Israelite Bay to Port Lincoln on May 16, a distance of 650 miles in $5\frac{1}{2}$ hours, which was their record non-stop flight, as well as being over the most difficult and dangerous section.

Previous to this they had flown from Albany to Israelite Bay in very bad weather, the flight from Esperance to Israelite Bay being made in blinding rain at a height of 100 feet from the sea. The date of this flight is not quite clear in the despatches received.

On May 18 they left Port Lincoln at 11.00 hours and reached Beachport at 14.30 hours.

On May 19 they arrived at St. Kilda, Melbourne, from Beachport, at 14.25 hours and landed in the presence of several thousands of enthusiastic spectators.

The Earl of Stradbroke, Lieut.-Gen. Sir H. Chauvel and the Federal Ministers were present to meet the Rolls-Royce Fairey IIID and its crew.

Air Chief Marshal Sir Hugh Trenchard sent a cable of congratulations on behalf of the Air Council.

Wing Commander Goble and F/O. McIntyre were given an official reception and a civic ceremony was afterwards held in the Melbourne Town Hall.

The total length of the flight round Australia, which began on April 6, was 8,568 miles and it was accomplished in exactly 90 hours' flying.

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AIR NAVIGATION REGULATIONS AND THE PRIVATE PILOT.

As a result of certain criticisms which he had made concerning the Air Ministry regulation of private flying the writer was invited to call at the Air Ministry in order that he might be assured that he had been guilty of gross exaggeration as to the restrictions which hedge about the flying of private aeroplanes.

As a result he is glad to be able to record that the view taken by Col. Beatty in a letter published in this issue is shared by the Air Ministry in so far as concerns the applicability of certain restrictions to this class of aircraft, and that in order to clear up all misconception on the subject an official notice will shortly be issued making clear what regulations do apply.

Pending this official statement the following rough outline of the official view of the regulations will be of comfort to would-be private pilots.

Private aircraft do not need ground engineer's certificates either for engine or for aeroplane.

Private aircraft—provided they are licensed and registered—are free to use any landing ground—subject to the consent of the owner thereof.

Private aircraft are subject to official inspection annually for the renewal of their Certificate of Airworthiness. The inspecting officials have power to call for stripping of the fabric for this purpose but will not generally exercise this power except in the case of machines of advanced age or obvious decrepitude.

There are now no specific running periods after which an engine must be overhauled. The question of when an overhaul is necessary is left to the discretion of the owner, pilot, or other responsible party.

Aircraft are deemed to be private aircraft when they are employed as such. That is to say a machine which normally plies for hire or reward may be flown with the same freedom as the purely private aircraft when it is not actually plying for hire.

As regards the requirement—for the granting of a private pilot's licence—of a medical examination the examination required may be carried out by the applicant's private medical attendant, and the requirements are not of a very stringent nature.

It will be seen that in fact the private pilot is now pronounced to be at liberty to do very much as he likes subject to his compliance with an appreciable number of preliminary formalities. Without in the least departing from the general opinion that the formalities involved are in the main unnecessary and vexatious, one is extremely glad to have the opportunity of dispelling the widely-spread misconceptions on the subject of the actual restrictions which are enforceable.—W. H. S.

THE PROHIBITION OF PRIVATE FLYING.

The following letter has been received :—

Sir :—The article in THE AEROPLANE of May 7, entitled "The Prohibition of Private Flying," gives such an erroneous view of the actual facts that it appears desirable to point out the falsity of its conclusions. I write as one not without interest in the drawing up of the regulations of which the article is a criticism.

I agree with Captain Sayers that the individual should be free to risk his own neck as he likes, and this certainly used to be the Air Ministry view. But he does not realise that the few restrictions imposed on the private pilot are designed for the safety of the general public in which Captain Sayers kindly permits the Ministry to take a legitimate interest.

It is in the paragraph headed "What you must do to fly" that the statements made are most widely divorced from the facts.

An individual who desires to fly any machine, at an aerodrome only, has only one requirement of the air laws to comply with—that is, if not licensed, he has to say that he proposes to practise with a view for qualifying for a licence This requirement is a recent addition to the regulations for which no good reason is apparent, but it cannot be considered a restriction.

THE REGULATIONS INTERPRETED.

If he desires to fly away from an aerodrome he must (a) use a machine which has been registered, for purposes of identification. (b) show that it is of a type unlikely to cause damage to the public through structural failure, i.e., the machine must have a certificate of airworthiness. (c) show that his standard of flying is above that which is certainly a danger to the public, and that he knows the rules of the air, i.e., he must have a "private" licence. (d) In order to obtain this licence he must be medically examined. Though logical, this recent addition to the regulations is, in my opinion, undesirable. The regulation, however, is so worded that it can be administered in such a way as merely to prohibit cross-country flights by epileptics or those in the last stages of heart disease.

The private pilot must also keep a record of his flights both for his machine and himself—hardly a restrictive necessity—and naturally must observe the rules of the air. If he wants to fly abroad he must obey the Customs regulations, as in the case of other methods of transport.

But the private pilot is in no way bound by the regulations to have a ground engineer, nor has he to confine his landings to recognised aerodromes. He can keep his machine in what condition he chooses, without breaking the law, and his landing places are entirely a matter of arrangement between himself and the owners of the land.

Those who listened to the debates on the last Air Navigation Bill must have fully realised that the millions in this country who do not fly are not prepared to sacrifice any of their rights or interests to the hundreds who do fly. (It was indeed necessary to combat a demand for more restrictive legislation than that actually proposed.)

THE INTERESTS OF THE EARTH-BOUND.

Now in the interests of the earth-bound public the possibility of structural failure of an aircraft must, as far as possible, be eliminated. There is ample evidence, in my opinion, in the possession of the Air Ministry to show that the responsibility for attaining this result cannot rightly be placed upon the individual designer or constructor.

But the Air Ministry did not, from its cobwebbed purlieus, produce a cut-and-dried scheme for determining the strength of aircraft. It took into consultation the best aeronautical advisers it could find, and, in the same way, altered its rules in the light of experience with the aid of the best advice from the industry. I can assure Captain Sayers that the present standards are based on the net conclusions of the aircraft designers of this country. And the requirements are specifically capable of alteration, in consultation with the designers in the case of machines of abnormal design, while the schedule of load factors is of considerable range with the object of making allowance for machines with widely diverse characteristics.

Indeed Captain Sayers appears to be somewhat inconsistent when he claims that our designers are capable of making a light aeroplane strong but incapable of making a strong aeroplane light.

The regulations do not prohibit the flying of a machine which is not of the specified strength. They merely say that such machines may only be flown when they are unlikely to be a source of danger to the inhabitants of the country, and the restriction on the unskilled pilot is exactly similar.

Even in the early days when flying was governed by a purely sporting body it was considered essential that pilots should pass a qualifying test before being permitted to carry a passenger or enter for competitions. An individual, unable to pass the present Royal Aero Club tests for a "private" pilot's licence, is certainly unfit to be allowed to fly about the country, while pilots, unable to qualify for the "passenger-carrying" licence, are obviously unfit to be trusted with paying passengers.

The possibility of delegating the responsibility for the issue of licences and certificates was not overlooked when the original regulations were drawn up, but experience has shown that some considerable time is likely to elapse before some such body as Lloyds can take over the necessary work.

The requirements in regard to "public" aircraft appear to me to have been shown by the light of experience to be sound; I will not refer to them further except to point out that in the article in question they appear to have been completely muddled up with those for "private" aircraft.

OF BRAIN FAG AND A SUGGESTED CURE.

So much of Captain Sayers' article is based on erroneous assumptions that I can hardly help suspecting that he wrote it "without the book." Or is it that over-much poring over blue prints and technical diagrams has resulted in atrophy of those brain-cells which normally would interpret official language— a tongue frequently obscure and of which the intelligibility is not increased when it is imbued with legal force.

If such is the case might I humbly suggest that a course of 12 works of Ethel M. Dell, taken alternately with a similar number of George Bernard Shaw would probably have such a massaging effect upon the cells concerned as to restore them to full activity. I should indeed be glad to learn of his restoration to full health.

(Sgd.) W. D. BEATTY.

IN PART REPLY.

Col. Beatty's opinion on the subject of Air Navigation Regulations are naturally well worth consideration, but as

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was pointed out in the article to which his letter refers the difficulty with Air Ministry regulations is not that they are irrational or indefensible in themselves, but that it is indefensible that any body should have it in its power to say "Thus and thus only shalt thou fly at all."

As to the actual applicability of certain of the regulations to private aircraft, if the meaning of an official document were necessarily the meaning which it conveys to the normal intelligent reader the article in question would not have been written as it was written. On the face of the regulations the private aeroplane would appear to be exempt from many of the more irritating of the requirements.

But it seems in practice that officials of the Air Ministry do take it upon themselves to apply these restrictions to private aircraft, and the would-be purchaser of such a machine is told by the potential constructor that the regulations—certainly in the matter of inspection by a ground engineer—do apply to such machines.

Neither my personal opinion of what the regulations should mean nor Col. Beatty's statement of what they were intended to mean has any very great bearing on the facts—and a definite statement made with the authority of the Air Ministry seems necessary to clear up the question of whether the current misconceptions on this head are due to over-zeal on the part of certain persons, or to the difference between the apparent and the legal meaning of official English.

[Since the previous paragraphs were written an assurance has been received from one of the highest possible authorities in the Air Ministry that the Ministry itself puts upon the regulations the same interpretations as are put forward by Col. Beatty, and that it may be expected that an official statement will shortly be issued making it clear that private aeroplanes are not subject to certain restrictions and that they have an appreciably greater freedom of action than had been supposed. This is of course excellent news, but it does not meet the general criticism of the Ministry's policy as a whole.]

AGREEMENT UNDER DURESS.

There is no ground for suggesting that I fail to recognise that the regulations are designed for the protection of the public. The whole point is that regulations of a detailed nature such as are in question fail to protect the public unless they become absolutely prohibitive, and that a very much more elastic and effective method of protecting the public is available by the processes of the ordinary law of the land.

Col. Beatty correctly says that the British standard schedules of load factors were the result of consultation with representative designers, and that they were agreed to by those designers. Col. Beatty however knows perfectly well the nature of the agreement into which one is forced in cases of this kind—one agrees to the least irksome regulations one can obtain lest failing agreement far worse be imposed.

He also states correctly that special cases are open to special consideration. Here again he should know that despite the courtesy, the willingness and the ability of the individual technical people who have to consider such questions in detail, it may take many months after they have made recommendations in favour of a concession before the recommendation has passed through the machine and an official "ruling" approving the concession can be secured.

Quite how Col. Beatty has so misread my remarks as to accuse me of stating that British designers can make a strong machine light but cannot make a light machine strong I cannot understand. What I did say was that if a machine was stronger than it need be it was also heavier than it need be, which is by no means the same thing.

THE RISK TO THE PUBLIC.

The interest of the earth-bound public in structural failure of aircraft—other than public service vehicles—is minute. The risk that an aeroplane which breaks in the air will in its descent alight upon a member of the public is negligible compared, say, to the risk that a motor-car with defective steering gear may hit a pedestrian. And the risk to the occupant of using a structurally defective aeroplane is enormous compared to any risk of the kind occurring with surface vehicles.

Liability for third-party damages combined with the individual instinct for self-preservation suffices to keep surface vehicles quite reasonably safe—it will certainly suffice in a case where the risk to the third party is in so vastly different a ratio to that incurred by the occupant of the vehicle.

It is indeed a fair illustration of the ill-conceived nature of the present regulations that every case that has come to my knowledge in the last 13 years in which a person not on board the machine has been hurt by an accident to an aeroplane has occurred either on or in the immediate vicinity of an aerodrome—the one place that is where the regulations do not apply.

I have no quarrel with Col. Beatty's claim that a pilot who cannot pass the flying tests for a pilot's licence is not fit to fly at large. I go further and say that when he can pass them he is equally unfit to fly at large if passing the tests is the limit of his capacity, and that therefore the tests are worthless for their ostensible purpose. Further the question which involves the public safety is not Can the pilot fly properly? but Does he do so? and it is to this matter that the Air Ministry should confine its attention.

The law does not provide that those who drive a vehicle on the streets shall prove their knowledge of the rule of the road before they are allowed to drive. The law lays down the rule of the road and provides suitable penalties for those who fail to obey it. Precisely the same attitude should be taken in respect to flying.

INSURANCE AND EMPLOYMENT.

Col. Beatty's claim that some considerable time must elapse before any body such as Lloyds can take over responsibility for the issue of licences, is scarcely accurate. As a matter of fact at the present moment the question of whether the Insurance Companies will insure a given pilot under the proposed conditions of his employment does determine whether that pilot shall be employed in the majority of cases of commercial aviation, and I cannot conceive of a responsible firm considering the employment of a pilot concerning whose ability to pass the Air Ministry's tests there was the least doubt.

But I do know of the case of a pilot who is *persona grata* to the Insurance companies who is engaged on work of a valuable nature in one of our colonies who has exhausted his 250 hours' flying time and now ought to make a journey of at least 2,000 miles before he can attend at a place where his licence can be renewed. Doubtless the Air Ministry will themselves find a way round their own regulations in this instance—but regulations which cannot be enforced without regard to special circumstance should be abolished.

I am particularly interested to hear from Col. Beatty of the difficulty which was encountered in combating the demand for even more restrictive legislation than was actually proposed in the Air Navigation Bill as presented to Parliament. I cannot profess surprise however. Obviously the attitude of the normal legislator faced by that Bill would be that if flying was so dangerous that even those who had an interest in its development felt that so many restrictions were necessary, then surely it was far too dangerous to be allowed to continue.

I am perfectly certain that had motor-car regulations of the bulk and complexity of Air Navigation regulations been in force for the last five years there would not to-day be any such outcry as exists from the motor trade concerning the threatened repeal of the McKenna duties. There would have been no motor trade to cry.

A HAPPY PARALLEL.

In conclusion I would congratulate Col. Beatty on the felicity of the parallel which he seems to draw between Air Navigation Regulations and the works of Ethel M. Dell and G. Bernard Shaw, and would agree most heartily that the Air Ministry as an author attains about the same degree of intelligible coherence as is to be found in the works of those he mentions.

But whereas I personally need not contribute—of my barely discernable income to the support of either Miss Dell or Mr. Shaw unless I am so disposed, I have to contribute to the maintenance of the Air Ministry much as I dislike their works.—W. H. S.

New Technical Literature.

The Journal of the Royal Aeronautical Society. No. 161. Vol. XXVIII. May 1924. Contents: Official Notices; Papers on:—Dopes and Fabric by Dr. J. E. Ramsbottom; Gliders, Their History and Uses by W. H. Sayers; Reviews. Published by the Royal Aeronautical Society, 7, Albermarle St., W.1. Price to non-members 2s. 6d.

Notes on Iron and Steel. By Brig.-Gen. R. K. Bagnall-Wild, C.M.G., C.B.E., F.R.Ae.S., M.I.Mech.E., M.A.I.E. Published by H.M. Stationery Office. Price 1s. 6d. net.

A Handbook for Oxy-Acetylene Welders. By L. M. Fox, M.I.Mech.E. Published by Allen Liversedge, Ld., Victoria Station House, S.W.1. Price 1s. 6d.

An Italian Airship Accident.

On Apr. 15 while the new Italian airship N.1 was being prepared for a test flight at Ciampino, near Rome, a sudden squall tore the airship away from its handling party of twelve men. Nine let go but the remaining three were carried aloft on the handling ropes. Efforts to land the airship hurriedly were unavailing and the three men fell from a height of 1,800 feet and were killed instantly.

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The Aeromarine All-Metal Boat.

It was noted in The Aeroplane some time ago that about the middle of January the all-metal flying boat built by the Aeromarine Plane and Motor Co. Inc., of Keyport, New Jersey, had left New York for a flight in the Gulf of Mexico. It carried as permanent passengers two magazine writers who have been doing an account of the trip in an American publication. The boat safely reached Cuba and spent some weeks visiting various towns along the coast carrying passengers. It behaved excellently the whole time. It eventually left Baracoa, Cuba, and flew to Porto Rico in one day, a distance of about 600 miles against a head wind.

Owing to defective sparking plugs in one cylinder the boat landed on a desert island off the coast of Haiti. In fact it flew from Cuba to Haiti on eleven cylinders. As an indication of the spirit in which the voyage was made it is worth while recording that the pilot and his literary passengers went for a swim while the mechanic worked on the engine.

After starting again they flew to the South-Eastern point of Haiti where they landed in a cove to measure their fuel supply. Finding that they had enough gasoline to take them to Porto Rico they started again but had to land off the coast in a high sea just about dark because the mechanic, having previously drained the gravity tanks, had pumped air into the fuel pipe. They still had enough petrol to see them through so they carried on and landed at the first place available which happened to be a lake near Manati, Porto Rico. Here they ran the boat ashore into the long grass and borrowed a car from an adventurous American and drove thirty miles into San Juan.

The next morning they took some extra gasoline out to the boat and flew to San Juan harbour itself. The last news from the pilot was that he was planning to fly some society people from San Juan to Culebra to take tea aboard one of the ships of the U.S. Fleet under Admiral Coontz.

It seems that the only complaint that the pilot has raised is that he will have to scrape the barnacles off the bottom of the ship as they are interfering with its get-off. Except while it has been flying it has not been out of the water since it left New York on January 16 and apparently the fact that it affords a home for barnacles is the worst thing that can be said against the duralumin hull. One imagines that having been in the open for a couple of months in subtropical sun may conceivably have affected the tautness and truth of the wings and that this may have as much to do with the deterioration of the get-off as the accumulation of barnacles.

In any case the Aeromarine boat has put up a very fine show and has proved conclusively that the metal hull is a business proposition and that as such it is worth the while of the British Aircraft Industry to investigate its possibilities.

Pioneering in the United States.

Some time in 1921 one Edward Hubbard, an American citizen, of Seattle, Wash., contracted with the U.S. Postal Department to carry mail from Seattle, Wash., to Victoria, British Columbia, to connect with outgoing and incoming trans-Pacific mail steamers. The contract called for not more than ten trips per month, the pay being $200 per trip.

Mr. Hubbard used a Boeing flying boat fitted with a 200 h.p. Hall Scott engine, and in the words of the Postmaster-General as contained in his annual report for the fiscal year 1922, " None of the 120 trips scheduled was defaulted and no accidents occurred in connection with this service." In the 120 flights, he covered a total mileage of 20,160, and carried 60,000 lbs. of U.S. mail.

During this period Mr. Hubbard with the very barest of equipment pushed off in any weather, often at night in order to connect up with the ocean boats, snow, fog, darkness and lack of night-flying equipment making not the slightest difference to the regularity of the service.

Early in 1923 Mr. Hubbard had the misfortune to crash his Boeing boat in attempting to land on a glassy-calm sea, but next day he was carrying on with a rapidly-converted Curtiss float seaplane fitted with an 150 h.p. Hispano Suiza engine.

On June 30, 1923, in spite of his 100 per cent. efficiency the U.S. Postal Authorities saw fit to award the Seattle-Victoria contract to a concern known as the Alaska Airways, of which no information is available in this country, which possessed an H.S.2L boat and sufficient confidence to undercut Hubbard's contract figures. Far from being discouraged Hubbard decided to carry-on with passenger transport.

The Alaska Airways held the contract for six months and during this period could not always get through with the mail when required. This resulted in a request from the U.S. Government to Hubbard to take the contract back again. This he did on Feb. 1, 1924.

Apart from the Seattle-Victoria service there are only two other privately operated air mail routes in the United States. These are the Key-West-Havana service of the Aeromarine Airways and the New Orleans-Quarantine service which like the Seattle-Victoria service connects continental and ocean mail.

These two services did not come into operation until the latter half of 1922, so that Mr. Hubbard must be regarded as the first private contractor for the carriage of the U.S. mail. The recognition of his ability is amply shown by his being re-awarded the contract this year.

It is doubtless the success of the Hubbard contract which prompted the Postmaster-General, Col. Henderson, in his address at the First National Air Institute to say :—" It is my personal opinion that within two or three years the Air Mail Service will have developed to a point where it will undoubtedly be thought wise to turn over the Service to private contractors and make it nation-wide in its scope, with higher postage than is now charged on ordinary letters."

As a pioneer, and a very dogged one at that, Mr. Hubbard deserves the very sincerest congratulations and it is to be hoped that when the U.S. Air Mail is turned over to private contractors he will be given an opportunity to prove his ability over much wider territory than in the past.

A German Gliding Record.

It is reported from Berlin that at a gliding meeting held on the sand dunes near Memel Herr Schultz remained in the air for 8 hrs. 42 mins. 8 secs., thus beating the existing French records. Herr Schultz landed above his starting point.

[A Herr Schultz, by profession a schoolmaster, entered for the 1922 Rhön meeting a home-made glider with an unusual control system—mainly dependent on large movable wing-tips. The Technical Commission dealing with these matters at that meeting refused to pass his machine as safe and debarred it from participation in the contests. Herr Schultz however persisted in flying it during the meeting and to such effect that the Committee felt obliged to award him a prize.]

Lieut. Pelletier d'Oisy's Equipment.

It is of interest to know that the magnetos used on Lt. d'Oisy's Breguet XIX are of the S.E.V. type manufactured by the Société Anonyme pour l'Equipement des Vehicles at Issy (Seine) and that magnetos of this make have been found to give the utmost satisfaction, not only in the case of this particular flight and in recent records set up by Sadi Lecointe but in the many other uses to which they have been put both on aircraft and in motor vehicles.

The well-known firm of Ripaults Ltd., of King's Road, St. Pancras, have the sole official agency for S.E.V. products in the British Empire and are prepared to give every possible information and assistance to those who wish to avail themselves of the undoubtedly excellent qualities of these appliances in this country.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 9; Tuesday, 14; Wednesday, 14; Thursday, 15; Friday, 14; Saturday, 12; Sunday, 9.

London—Paris and London—Cologne :
Imperial Airways, Ltd., machines 38, passengers 121, freight —.
Paris—London :
Air Union, machines 36, passengers 131, freight 24,962 lbs.
London—Rotterdam :
K.L.M., machines 12, passengers 26.
Special Machines :
De Havilland Hire, machines 1, passengers 1.

Total number of trips by British machines : 39, carrying 122 pas. Foreign machines : 48, carrying 157 passengers.

Comparative Figures :
For week ending May 18 :
Machines, 87; Passengers, 279; Crews, 137; Total personnel, 416.
Corresponding week, 1923 :
Machines, 109; Passengers, 444; Crews, 177; Total personnel, 621.
Corresponding week, 1922 :
Machines, 114; Passengers, 215; Crews, 186; Total personnel, 401.
Corresponding week, 1921 :
Machines, 75; Passengers, 230; Crews, 90; Total personnel, 320.
Corresponding week, 1920 :
Machines, 84; Passengers, 103; Crews, 87; Total personnel, 190.

Croydon Notes.

Imperial Airways Ltd. are now going strong and the Paris, Brussels, and Cologne routes are in full working order. All the pilots of the old air lines with the exception of Lt.-Col. G. L. P. Henderson have joined the new company. The loss is with the Imperial Airways Ltd.

The new company have not yet been able to get their organisation fully into swing which accounts for the fact that the passenger figures are still low.

Pilots, machines and routes are being mixed, doubtless with a view to discovering which pilots and which machines are best suited to one another and to the different routes. Fir instance, on Thursday last week Mr. Hinchliffe flew a W.8. to Paris and back and the following day Mr. Olley flew a W.8. to Cologne and Mr. Youell flew a W.8. to Paris and back. On Sunday Mr. Robins flew a W.8. to Paris and back. So far none of the Handley Page pilots seem to have flown the 34's, but doubtless they will do so this week.

At the Aircraft Disposal Company Mr. Perry was testing an Avro-Lucifer on Monday. The following day Mr. Wheeler an R.A.F. Reserve instructor, tested a Renault Avro for the Reserve and on Friday Mr. Perry tested a Bristol Fighter.

Northern Air Lines.

The service between Liverpool and Belfast has been running lately with great regularity. Two D.H.50's flown by Mr. Cobham and Mr. Dickinson have been used. Two big sacks of mails are carried on each machine daily and the applications from would-be passengers are sufficient to enable three machines per day in each direction to be run.

The main trouble at present is that the recent rains have made the surface of both the Belfast and Liverpool aerodromes very soft and Mr. Dickinson had a slight mishap when taking off at Belfast aerodrome with four passengers. The machiie failed to unstick, but nobody was hurt.

For the time being another areodrome some 15 miles out is being utilised, but the trouble will doubtless disappear as soon as the fine weather comes.

THE GLOBE TROTTERS.

The Paris Tokio Flight.

Lieut. Pelletier d'Oisy arrived at Hanoi on May 13 where he was given a great reception by the French residents. M. Maginot, the French Minister of War, has placed the name of Lieut. Pelletier d'Oisy on the list of officers due for promotion to the rank of captain, and has also recommended Serjeant Besin, his mechanic, for appointment to the Legion of Honour.

The following is the itinerary of the flight from Paris to Hanoi :—

Apr. 24, Paris-Bucharest (2,000 km.); Apr. 25, Bucharest-Aleppo (1,600 km.); Apr. 26, Aleppo-Baghdad (800 km.); Apr. 27, Baghdad-Bushire (900 km.); Apr. 28, Bushire-Bandar Abbas (700 km.); Apr. 29, Bandar Abbas-Karachi (1,450 km.).

May 3, Karachi-Agra (1,300 km.); May 5, Agra-Calcutta (1,350 km.); May 9, Calcutta-Rangoon (1,250 km.); May 10, Rangoon-Bangkok (600 km.); May 11, Bangkok-Saigon (800 km.); May 13, Saigon-Hanoi (1,300 km.).

The average length of the various stages has been 1,170 km. (731 miles) and the average speed throughout the 13,950 km. flight has been 190 km. (119 miles) per hour.

At Hanoi the 370 h.p. Lorraine-Diétrich engine has been replaced by a new engine previously sent out with other spares for both machine and engine, and the old engine is being sent back to Paris in a sealed case for examination by the Section Téchnique.

Lieut. Pelletier d'Oisy is reported to have arrived at Canton from Hanoi on May 18. On May 20 he had reached Shanghai.

The British Expedition.

Squadron-Leader Maclaren who had been held up at Parlu since Apr. 26 owing to stripped reduction gear and broken crank-case has again got under way.

A 450 h.p. Napier Lion engine had been received from the R.A.F., Iraq, and this was installed after the necessary alterations in the water-pipe lines and connections thus converting it from a tractor to a pusher engine.

On May 13 the Vickers Vulture left Parlu at 05.35 hrs., local time, and arrived at Nasirabad at 07.30 hrs. Owing to a leaky radiator the flight to Allahabad was postponed until the following day.

On May 14 the expedition left Nasirabad at 06.00 hrs. and arrived at Allahabad at noon, having covered the 490 miles in 6 hrs. Here a tropical radiator supplied by the R.A.F., Ambala, was fitted.

At 05.18 hrs. on May 16 the Vulture left for Calcutta, and landed on the Dum Dum aerodrome (just outside Calcutta) at 11.15 hrs. The crew was met by the Commanding Officer of the 1st Camerons, some R.A.F. officers and not more than 50 spectators.

Owing to the Dum Dum aerodrome being on the small size it was decided to fly into Calcutta early the following morning and run the amphibian under the shade trees of the polo ground on the Maidan.

At Calcutta the new low-compression engine will be fitted in place of the engine installed at Parlu. This is being done because the high-compression engine requires a benzol mixture which may not be procurable during the later stages of the flight. The new engine was due in Calcutta on May 18.

In the meantime the crew are thoroughly overhauling the machine which suffered from exposure at Parlu.

Sq. Ldr. Maclaren has laid emphasis on the fact that he had no fault whatever to find with the engines he has had. All had worked splendidly and it was only the sheerest ill-luck that there had been irritating and delaying mishaps.

The American Expedition.

On May 17 Lieuts. Lowell H. Smith, Leigh Wade and Eric Nelson, U.S.A.S., of the U.S. Air Service Round-the-World Expedition arrived at Paramurshiru, the northernmost of the Kurile Islands, from Chicagoff, a distance of 936 miles. On this flight they encountered strong winds, snowstorms and fog, and as a result they were forced to land off Koloski, Behring Isle, for six hours. U.S. Navy destroyers which are on patrol in connection with the flight had previously warned Lieut. Smith the commander of the expedition of the unfavourable weather conditions.

Lieut. Smith wirelessed the following details of the flight to Washington :—

> Left Attu Island at 11. Snowstorms over Pacific forced us to alight off-shore at Komandorfski at 8 Arrived at Paramurshiru at 11.30. Flight was over fog for 25 per cent. distance, and through snow for 10 per cent. Rest was accomplished in excellent weather. Planes and personnel O.K. Leave next good weather.

With this flight the American expedition is now across the Pacific Ocean.

Mr. Butler's Flight.

Mr. Alan Butler the chairman of the De Havilland Aircraft Co. Ltd. is making good progress with his business-and-pleasure tour of Europe on the D.H.37 (Sylvia). He has recently visited Belgrade and Bucarest, and on May 16 he arrived in Vienna. By now he is probably at Prague. This is certainly the first occasion on which the chairman of a big aircraft concern has made a tour as a pilot.

PERSONAL NOTICES.

Deaths.

MACKENZIE.—On May 16, killed on duty in an aeroplane accident near Quetta, India, Edward Charrington Mackenzie, Lieut., R.G.A., third son of the late Harman Mackenzie and Mrs. Mackenzie, of 73, Worple Road, Wimbledon, S.W. [Mr. Mackenzie was passenger with Flg. Off. Usher-Somers.]

USHER-SOMERS.—At Quetta on May 16, as the result of a flying accident, Edmund Cronin Usher-Somers, Flg. Off., No. 20 Sqdn., R.A.F.

Marriages.

DAVIS—SONGHURST.—On Apr. 23 the wedding took place at the Strand Registry Office of Clarence Tremaine Davis, R.A.F., son of Mr. and Mrs. C. Turner Davis, of Handsworth, Birmingham, and Doris Mary, daughter of Mr. and Mrs. Songhurst, of "Catterick," Bexhill.

Birth.

LOCK.—On May 13, at 104, Junction Road, Andover, to Phyllis, wife of Flt. Lt. H. G. W. Lock, D.F.C., R.A.F.—a son.

The marriage arranged between Flight Lieutenant C. F. Horsley, M.C., R.A.F., and Kathleen, daughter of Mr. and Mrs. Arthur Sims, of Bromley, Kent, will take place at St. George's Church, Bickley, Kent, on Saturday, June 14

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THE AEROPLANE

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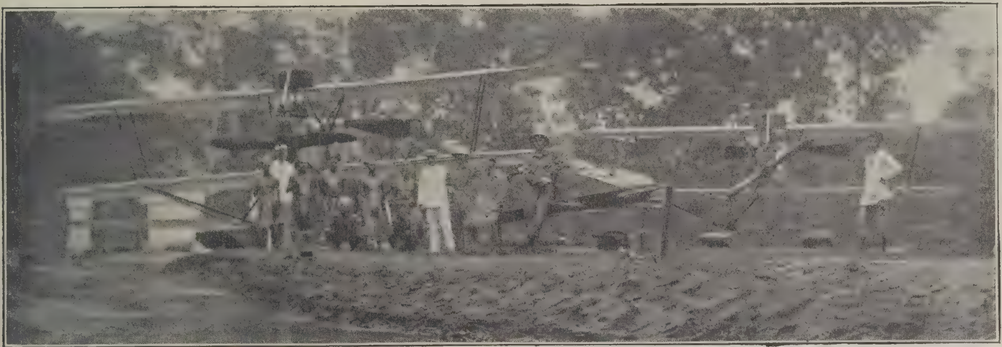
Edited by C. G. Grey

Vol. XXVI. No. 22. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

TAMING THE WILD MEN OF BORNEO.



WHY THEY ARE WILD:—An interesting photograph of the Dutch Royal Naval Air Service at work in Central Borneo. An emergency repair to a seaplane float 250 miles up the Barito River in the region of the head-hunting Dajak (Dyak) tribes. The sender of the photograph remarks, "One of the rather unexpected effects of similar trips—besides giving Government officials an opportunity for quick inspections which would otherwise require weeks of virgin forest travelling and prao sailing—was the natives suddenly paying their taxes." The machines are old faithful wartime Dutch-built Brandenburgs with 180 H.P. Mercedes engines.

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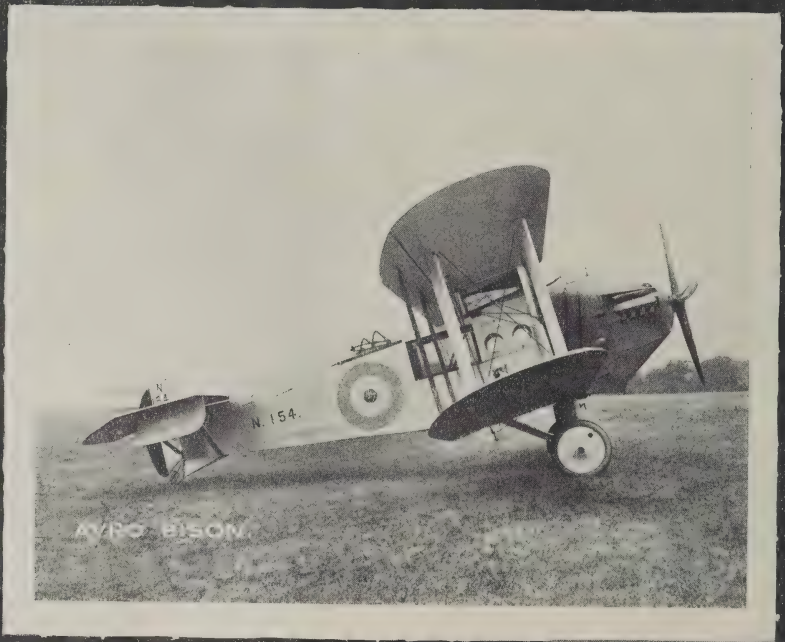

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ON THE "DEATH RAY."

Much excitement has been displayed by daily news-sheets during the past week concerning a wonderful new ray which a Mr. Grindell Mathews is alleged to have discovered. This ray is supposed to be able to stop the operation of the ignition apparatus of the engines of aircraft and automobiles and so to be able to prevent attacks by mechanically-propelled vehicles in the air or on land or on water. It is also supposed to be able to ignite ammunition at a distance. And, if supplied with sufficient power, it is supposed to be able to destroy life and to burn substances with the combined effectiveness of a high-tension electric current and an oxy-acetylene flame. Altogether it seems that if such a ray existed it would be a most unpleasant toy to have about the house.

Far be it from one to say that such a ray cannot exist. When one has seen the rays of the sun concentrated through a magnifying glass setting fire to a piece of paper or burning a hole in somebody else's clothing one is prepared to believe that if it were possible to make a big enough glass and to find enough sun it would be possible to destroy London more effectively and rapidly than our house-breakers and road-menders are doing it. But one realises that there are certain difficulties about supplies both of glass and sun.

It is a fact familiar to all electricians that by applying electrical forces in a certain way it is possible to interfere at very short range with other electrical apparatus, and with apparatus which is not electrical. For example an ordinary watch is considerably upset by a visit to a big dynamo. And every "radio fan" knows how his own box of tricks is made to howl by the careless or inexpert tuning of a neighbouring instrument. That little knowledge which is a dangerous thing makes people who are aware of such elementary scientific facts the more liable to believe the claims of optimistic inventors who produce vague technical explanations of the phenomena which they propose to produce provided that somebody else will find the money with which to make their apparatus and thereafter to supply the power for it.

The public and the press and official personages are made the more susceptible or penetrable to the claims of inventors by the progress made in some branches of science during the past few years. Wireless telegraphy and telephony has contributed largely to this state of affairs.

For example Mr. Grindell Mathews claims to have spoken audibly by wireless telephony before the War 1914-18. In any case wireless experiments by the R.F.C. at Brooklands in 1915 (conducted, if one's memory serves, by an officer named Furnival of the Westmorland and Cumberland Hussars with the assistance of a gunner officer named Cherry and the late Cecil Marks of the R.F.C. and one P. K. Turner of the R.F.C., formerly of the staff of THE AEROPLANE) made communication possible between the ground and aeroplanes at a range of some few hundreds of yards.

By the end of the War so much progress had been made in radio transmission that wireless telegraphy had produced a portable wireless set for the use of infantry in the trenches so simplified that it was known officially and descriptively as the "B.F. Mark I." type. And wireless telephones were used on some few of the aeroplanes of the Royal Air Force. Today we have broadcast transmission of vocal and mechanical sounds over distances up to some thousands of miles, which sounds are reproduced in millions of homes with all the volume and virulence of a bad gramophone.

Arguing along these lines people who have had the Rule of Three drummed into them at school may be persuaded easily that if Hertzian or radio or wireless waves (call them which you will) which ten years or so ago could only be transmitted and received over a distance of a hundred yards can now be operated over two thousand miles therefore an electrical wave which will annoy a magneto to-day at ten feet can be made ten years hence to stop a magneto at a hundred miles. It is so simple—as a well-known advertisement says. And especially simple are the people who believe in such an argument.

Without in any way disbelieving the claims of Mr. Grindell Mathews one would like to know a great deal more about the first principles of his ray before commiting oneself to a belief in them. One has it on the authority of one or two bright young men who collaborated with him during his pre-war wireless telephone experiments that the methods on which he was then working were quite old and well known to a number of electrical specialists. His results were only impressive to those uninformed in such matters. And the methods by which success in radio-telephony were ultimately achieved bore no likeness to those of Mr. Mathews.

It is announced in support of Mr. Mathews' claim to Government attention and financial support that during the War 1914-18 he produced some apparatus or other for which he was awarded £25,000 by the Admiralty. That argument seems rather to be begging the question. We all know people who were awarded peerages for alleged services during the War, but we are not convinced on that account that we ought to support them financially in their present projects. And anyhow the Admiralty is a curious institution, for it must have spent as many thousands of pounds over the Brennan torpedo which was never of any use as the Air Ministry has spent over the Brennan helicopter. So one is not prepared to accept the Admiralty's actions as evidence.

Some newspaper people who are supporting Mr. Mathews, or rather are using him as a bludgeon with which to hit the Government in general and their pet aversion the Air Staff in particular, keep on trotting out that ancient exploded story that the Germans have a ray which brought down a number of French aeroplanes on the Strasbourg-Prague line last year. For the benefit of those who missed the true story in THE AEROPLANE at the time it is well to repeat it.,

The French machines on that line were then using engines which had a nasty habit of developing defects (or in vulgar language "conking out") after flying a definite number of miles. Those failures occurred over a distance of which the area in which these machines descended is about the centre. Before and beyond it are areas of hill and forest country. If an engine went wrong before reaching that area the pilot staggered along as best he could and landed in the good country. If the engine showed signs of trouble while over the good country the pilot landed there rather than face the bad country beyond with a failing engine. And if an engine went wrong while over the bad country the pilot did his best to struggle back to the good country.

Consequently that good landing area was littered with French air-liners which had been forced to land by defective engines and had been confiscated by the Germans as trespassers. Some comic French journalist invented, probably as a joke, the story of the deadly ray which caused all those engines to fail. And to save the faces of the French aircraft trade as well as to spite the Germans the yarn was circulated assiduously all over the World. So that is that.

Then, just to show that the French are as clever as the Germans, somebody else invented the story of the French scientist who had invented a ray which stopped lorries and taxi-cabs outside his window, and, more wonderful still, started them again when he switched off the ray. The dear old *Morning Post*, with its inimitable faculty for backing wrong 'uns (as the horse-racing people say), made quite a large song about it on different days. And a number of other papers bought it badly. But since then nothing further has been heard about it till this latest anti-Air Ministry strafe has arisen.

Like the *Morning Post* among newspapers there are individuals who are quite useful in the world because of the uniformity with which they back the wrong horse. They are even more useful in life than are the more successful tipsters of winners, because their results are more uniform. There is at least one such among the prominent backers of Mr. Grindell Mathews. For that reason alone if one were a betting man one would personally lay very long odds against Mr. Mathews' ray being any use to anybody—except to himself, if he can get enough money to finance his further experiments and to keep him in comfort while those experiments continue. In which quest one wishes him luck.

Apart from all that one doubts whether it is worth the while of the Government to spend money on these experiments. The ray can have no commercial value, as has wireless telegraphy and telephony. The wiser course seems to be to let somebody else buy the pup and rear it if they can till it becomes a full-grown dog. Then we can buy the dog and discover how to poison it. For the great thing to remember is that each of these destructive ideas has its defensive antidote. There is always the old contest between the gun-maker and the armour-manufacturer.

In the meantime Mr. Grindell Mathews has penetrated to the Air Ministry, presumably under political pressure, and was to have given a demonstration of his ray to our respected Member for Supply and Research on the Air Council about the time when this paper was going to press. One hopes that distinguished officer has had a pleasant interlude in his strenuous day's work. He has a keen sense of humour and these demonstrative experiments are always frightfully funny.—C. G. G.

A Business Tour of Europe.

As already noted Mr. Alan S. Butler, Chairman of the De Havilland Aircraft Co. Ltd., has recently been making a tour of Southern and Central Europe in the interests of his firm. This is certainly the first time that the director of an aircraft company has visited potential foreign customers by air and probably it will be some time before another chairman of an aircraft constructing company is his own pilot on an aerial tour, business or otherwise.

Mr. Butler took with him his personal engineer, Mr. K. C. Brown, who served in the Motor Launch Service during the War and has since been with Mr. Butler on a demobilised M.L. which he has been using as a yacht. The machine used was the famous D.H.37 (Rolls-Royce Falcon engine) known as Sylvia who as usual behaved, in a manner worthy of her namesake, like a perfect little lady.

After an uneventful voyage from Croydon to Paris in 1 hour 55 minutes Mr. Butler left Paris on the morning of Apr. 17. He landed at Joigney owing to a rag which had been left on the fuselage flying back and sticking in the tail controls, fortunately without jamming anything. Passing over Macon he landed at Lyon at 15.15 hours. After a stay there he started again but when still within reach of the aerodrome found his engine running badly so returned and landed at 17.30, where the rest of the evening was spent in cleaning out a choked oil filter.

On Apr. 19 he left Lyon at 15.48 with a 60 m.p.h. wind behind him and passing over Avignon and Fréjus at 10,000 feet he landed on the strip of shingle known as the Californie Aerodrome at Nice at 18.05 hours. Thence he drove to Cannes where he stayed some days with relatives.

On Apr. 30 Mr. Butler left Nice at 11.30, flew along the Riviera to near Genoa and then turned north over the mountains, landing at Milan at 13.15. After lunch there he left at 15.45 and landed at Venice at 17.00 hours. Here again he stayed with relatives for a few days.

On May 3 Mr. Butler left Venice at 11.15 hours and climbed over the mountains to Görz (otherwise Gorizia) which was the central point of the Austro-Italian fighting until the Italian defeat at Caporetto. There he was forced down by a choked carburetter. He landed on the disused Austrian aerodrome which is in good condition. Leaving there at 14.00 hours he arrived at Zaghreb (more generally known as Agram) in Yugo-Slavia at 15.00 hours, a very fine flight over the mountains. The landing was rather awkward and burst a tyre.

On May 4 he left Zaghreb at 16.30 and landed at Belgrade at 19.00 hours, after a comfortable flight in pouring rain which kept the air quiet. The Belgrade aerodrome is at Panchova which is 1½ hours by boat from Belgrade. This seems a very inconvenient arrangement and would annul most of the benefit of flying but for the fact that the trains in that part of the World run so slowly that one can afford to waste an hour and a half in this way even over a short distance such as that from Zaghreb.

The Panchova aerodrome is run by the Franco-Roumaine Company and one learns from various sources that it is very badly managed. The officials are not anxious to oblige anybody and the men are slack and lazy about filling up with petrol and water and generally doing the odd jobs which are required. The whole place is a marked contrast to the other aerodromes run by the Franco-Roumaine Company where work is done smartly and willingly. And the difference is even more noticeable when compared with the aerodromes operated by the Governments of other Central European countries.

On May 6 Mr. Butler went from Panchova to the Serbian Military Aviation centre at Novi Sad to see the chiefs of the Yugo-Slav air service. Here everybody was most civil to him and the aviation experts were very much taken with the machine.

On May 7 Mr. Butler left Belgrade at 15.00 hours and landed at Sofia at 17.20, after flying against a gale half the distance. The aerodrome at Sofia is excellent and the Bulgarian authorities were very friendly. Military aviation is forbidden in Bulgaria but a great deal of training of pilots and mechanics is being done at Sofia, chiefly on French machines such as Caudrons and Potez belonging to the Bulgarian Government. Thus Bulgaria is training officers and men for her air service in the next war.

On May 10 Mr. Butler left Sofia at 05.30 and after crossing the mountains was forced to land in the Danube valley because the water in his radiator was boiling. Here he and Mr. Brown removed the cowling from the engine which they stowed in various parts of the machine, and thereafter the engine kept cool. They reached Bucarest in 2 hours 20 minutes flying time as against 30 hours taken by the best train service for the same journey.

At Bucarest the radiator which was leaking was mended while Mr. Butler was visiting the Roumanian authorities, who were also immensely impressed by his flight. As is always the case in Roumania everybody was civil to the English visitors. Prince Carol, the Heir to the Throne, who is much interested in aviation, inspected the machine and was favourably inclined towards it.

On May 15 Mr. Butler left Bucarest at 06.15 and arrived at Belgrade (Panchova aerodrome) at 08.30 to fill up with petrol. The service there being as bad as ever he was unable to get away till 11.15. He arrived at Buda Pest at 12.30, where he stopped to clean carburetter filters. Leaving there at 15.30 he arrived at Vienna (Aspern aerodrome) at 16.40. Here it was found that two cylinder jackets were leaking so these were welded by Austrian mechanics and a very good job was made of them. Mr. Butler paid his usual visits and was very kindly received by our good friends the Austrians.

On May 20 he left Vienna at 11.00 hours and arrived at Prague (Kbely aerodrome) at 12.45. Here he visited a number of the Czecho-Slovak aircraft factories and was very much impressed by the designs of the machines and by the way in which the factories were run and by the good quality of the work. The authorities and the unofficial people as well were extremely kind and obviously very friendly to the English.

On May 22 he left Prague at 09.30 and reached Köln (otherwise Cologne) at 13.00 hours. After filling up with petrol he left at 14.00 hours and was forced to land at Thielt in Belgium in a ploughed field owing to choked petrol filters. After a difficult get-off from the ploughed field he left at 18.00 hours and flying through rain and thunderstorms arrived at Croydon at 19.30, whence after clearing the Customs he finished his journey at Stag Lane at 20.00 hours.

The machine carried luggage for Mr. Butler and Mr. Brown together with spare magnetos and a number of small spare parts. Altogether it was carrying a 200 lb. overload, which did not seem to affect its flying qualities in the least. Nothing whatever had to be done to the machine throughout the tour except repairing the tyre punctured at Zaghreb. Considering that Mr. Butler has only learned to fly since the War the flight was an excellent performance and demonstrates his competence both as a pilot and a navigator. It is to be hoped that his efforts as a business man may prove equally successful.

Viscount Curzon, M.P.

The following is taken from the *Morning Post* of May 22 :—

> Viscount Curzon, M.P., speaking on "The Navy, the Air, and the Empire and Politics," before the members of the 1912 Club on May 21, said that the attacks on the Navy came from three main sources: The pacifists, whose sincerity must be respected; the economists, and the enthusiasts of the Air Force. The Navy was essentially a defensive force. For over 100 years it had not been used for aggressive purposes. The economists said that we were spending £55,000,000 on the Navy to day: why spend more than before the war? The reason was that there had been a war, and part of the Navy had become obsolete. If the Navy was reduced we were unable to speak in the interests of peace. The Navy ensured peace.
>
> As to aircraft, it might control the narrow seas, but the broad waters of the ocean needed the Navy. On the oceans the Navy remained the same as in the days of Nelson. [One suggests that it is quite time that it adopted more modern ideas.—Ed.]
>
> On the subject of Singapore, he declared that upon no question had the British public been more deliberately misled. Singapore was the point which controlled the trade routes of the East. It would be of enormous importance to the Empire.

Air Affairs in Parliament.

In the House of Commons on May 13, in reply to a question by LIEUT-COL. SIR JOHN NORTON GRIFFITHS, the UNDER SECRETARY OF STATE FOR AIR said that owing to the conditions in Iraq leave could not be given for the troops quartered there to have their wives with them. The climate was unsuitable and in view of the limited period during which Imperial troops were likely to remain in Iraq it was not possible to provide accommodation out of service funds. For this reason the period of service in Iraq was considerably shorter than on most foreign stations.

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AIRSHIPS IN THE HOUSE OF LORDS.

One of the drawbacks to the system of government of the people by the people for the people, commonly called Democracy, is that whenever the Government of the moment wants to do anything it has to let the Representatives of the People debate the subject. This has the double disadvantage of delaying the Government's actions and of occupying in the newspapers a lot of room which might better be devoted to more interesting or more amusing material.

The House of Lords is, if anything, more representative of the People than is the House of Commons because its members are either hereditary legislators whose forefathers won their Membership by the heaviness of their hands or by the hardness of their heads or else they have been appointed by fairly intelligent Prime Ministers on account of some outstanding ability. At any rate they are not demagogues who have been elected by misleading appeals to the hysteria of an unintelligent electorate composed largely of non-English elements. For that reason speeches in the House of Lords are on the average more sincere and more intelligent than those in the Commons and so are the more worthy of being placed on record.

It is only possible in the limited space available in this paper to publish a strongly condensed version of the speeches which were made on May 21 on the Government's airship policy but one has endeavoured not to miss any essential point. Where comments have seemed necessary they appear in brackets so that there may be no confusion between the utterances of noble Lords and mere editorial opinions. Some of the statements in the debate will be of historical value in the future, when it will be of interest to compare them with the happenings of the time. Others deserve to be placed on record as indicating points of view which are worthy of consideration in the present, or as showing what was intended in the past.

With these preliminary remarks let us proceed to the subject under discussion :—

THE DEBATE.

In the House of Lords on May 21 **Lord Gorell** "moved for papers" concerning the Government's airship policy. Speaking as Under-Secretary of State for Air when all airship work was closed down he said that the decision was taken solely on the grounds of finance. Then the Burney scheme was put forward and they were still discussing it when the Coalition Government came to an end. A fresh scheme had been accepted by the late Government just before the new Government came into power. That was to inaugurate a full airship service. The present scheme meant that there would be further experimenting and so forth.

The Secretary of State for Air, the Lord Thomson, said that the Government recognised fully the necessity on Imperial, Commercial, Naval and Military grounds, for proceeding with the development of lighter-than-air vessels. He stated the reason thus :—

> As a nation we cannot lag behind either France or the United States in this respect. In fact, our need is greater than that of any other country. An improvement of Imperial communications which would bring India within seven days and Australia within fourteen days of our shores is obviously a matter of extreme importance, while, if airships can be operated in all climates, and even under adverse weather conditions, not only will there be a great commercial future for them, but by their means it may be possible to effect considerable economies in the Naval and Air Estimates.

He dealt at considerable length with the figures involved, all of which had been more or less set forth by the Prime Minister in the House of Commons.

Referring to the Burney scheme he said that a successful business man of wide experience after seeing the description in the newspapers had said that what struck him most was not the heavy rate of remuneration to be paid to the Company during the constructional, initial and operational stages but the position that the Company would occupy at the end of those fifteen golden years, and that Company obviously would have a monopoly. Lord Thomson said that no other airship firm could possibly compete with it in view of the immense sums of public money with which it would have been endowed. The group behind it would become the one and only airship provider in the country and would enjoy complete freedom to make contracts with other Powers besides enjoying a most enviable independence of Treasury control.

The general impression left after the negotiations was that Commander Burney was averse to any tightening of the agreement to meet the technical objections of Air Ministry experts. For example he did not propose to construct what the Air Ministry considered suitable bases in India and thought of utilising the untried method of mooring masts on monitors which in the opinion of the Air Ministry experts would have involved unwarrantable risks.

On the other hand justice demanded a recognition of the advantages of the Burney scheme. If all went well a fleet of six commercial airships might have been provided within seven or eight years and the sum staked by the Airship Guarantee and Construction Company on the success of the enterprise would have been an incentive to energetic efforts. He said that the enthusiasm, optimism and driving power of Commander Burney had been remarkable and that he had kept alive interest in airship development when others doubted. All the leading firms interested in airship construction with the exception of the Burney group had held back. Under the new scheme Lord Thomson said the Air Ministry hoped to get useful data from Commander Burney's experiments and all the research and experiment to be carried out by the Air Ministry would be placed freely at Commander Burney's disposal. They hoped in fact to pick one another's brains.

The Duke of Atholl interpolated a question as to whether the Air Ministry intended to pick Commander Burney's patents as well. [One might also ask what the Air Ministry intends to do about Commander Boothby's patents? These appear to cover inventions which will go further than most others to make airships a commercial success.]

Continuing, Lord Thomson said, that failing agreement with the Burney group the same offer would be extended to other airship constructors. The first offer of the construction of the new commercial airships was given to Commander Burney in recognition of his past services.

Two Advisory Boards would be set up. The first of these would deal with the broader aspects of airship development and would comprise representatives of the Treasury, the Admiralty, the War Office, the Air Ministry, the Colonial Office and the Post Office. The second would be purely technical and would include representatives of the Air Ministry, the Admiralty and the War Office, with power to co-opt such outside technical experts as might be found desirable. Questions affecting personnel and the relations between the Admiralty and the Air Ministry would be referred to the Committee of Imperial Defence.

The Government would be spending £1,200,000 in the first three years. The commercial airship would cost about £350,000 and the building of the Government ship would run to close upon £1,000,000. But for this the Government would provide in less than three years firstly extended experiment and research. Secondly a new airship of largest size would be provided. Thirdly a reconditioned airship would be available for experiments. Fourthly an air highway to the East would be provided. The terminal station in India alone would cost close on a quarter of a million pounds.

He remarked that one set of critics objected to any form of Government control as being the thin end of Socialism and another set objected to any taint of private enterprise. His immediate object was to enlist the co-operation of private enterprise in these early stages, not so much in competition with the Air Ministry but rather in a spirit of emulation.

He reminded the House that the history of aviation was largely based on combinations of this sort. The efforts of early pioneers proved it. They wanted to make money but they also made sacrifices. They tried and failed and tried again while the World looked on. These pioneers not only proved their case but many of them made their fortunes and, he added, "I may be mistaken, but I will take the risk of assuming that even the keenest business men are not inspired by wholly sordid motives, when they co-operate with the Government in the conquest of the air."

Further Lord Thomson said that during his conversation with Commander Burney he was much impressed by the possibilities of establishing commercial relations with foreign countries for the building of airships. The firms with which Commander Burney was associated [Vickers Ltd. and the Shell Company] had world-wide connections and if Britain could become the leading country for the construction of airships the advantages were obvious.

In conclusion he said that as in other branches of aviation a great amount of patience and imagination was required. By patience he meant the power to discriminate and wait and not let oneself be rushed.

He added that imagination was needed to give vision. His own vision was not sufficiently distant to enable him to foresee the time when the debentures under the original scheme would be repaid but he very often had a sort of vision as to what aviation would be in the future. He described his vision thus :—

> I can foresee the time when noble Lords will leave this House and the terrace in gliders with light engines, winging their way westward along the valley of the Thames, northward to Scotland, and southwards to Hampshire, Berkshire and Kent.
>
> On their way—and this is my main point—they will need to rest, perhaps they may call in at some great flying caravanserai in order to take a rest or greet a friend, and that great caravanserai may

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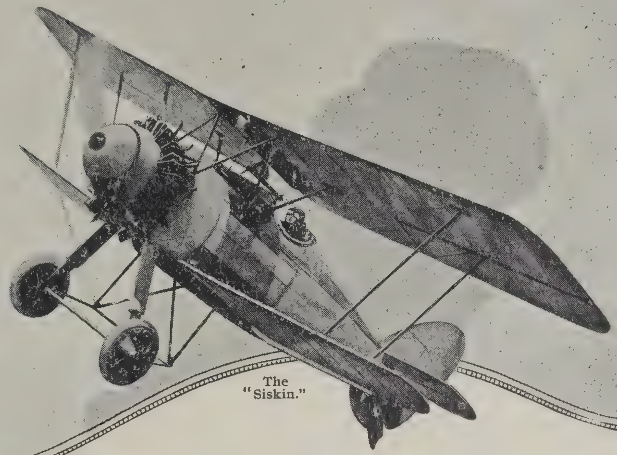

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be one of these giant airships floating serene and safe high up and far removed from terrestrial dirt and noise.

Under a private enterprise scheme there would be no guarantee as to these airships, but under the scheme which the Government put forward each airship would have a certificate of air-worthiness, and if any of your Lordships ever should perch on one of these, officially you will be safe, and I sincerely hope you will also feel safe.

[The idea is distinctly humorous but one cannot help thinking it rather a pity that Lord Thomson should have taken that particular view at that particular moment. The idea of an aerial Tagg's Island or Eel-Pie Island, or even a stopping place as high in the social scale as Murray's Riverside Club, is well enough to inspire the pencil of Fougasse or Mr. Tom Webster or our Mr. Bridgman, but it is really putting aviation rather low in the scale to think of it in that particular way. It hardly seems likely that anybody flying down the Thames valley or to the South coast would want to stop on the way, unless constitutionally arid. And surely some better use could be found for obsolete airships than merely turning them into aerial pubs.]

Finally Lord Thomson said that in ten years' time he hoped to see at least half-a-dozen airship constructors competing for orders in this country and building up a great and growing industry, serving the purpose of Imperial communications, bringing the peoples not only of our Empire but of the World closer together and carrying freight as well as mails.

The Marquess of Salisbury said that there was no Party question about Imperial Defence. As to patience he said that there had been too much of it in the provision of aircraft. When the late Government came into being they found that so much patience had been exerted that we were almost deprived of an air service. As to enterprise he said that broadly speaking it could not be found so freely among officials as among outsiders. If we were anxious to be ahead of time in airship construction we should turn towards private enterprise. He was all for letting private enterprise bear the loss of failures in experiments and for preventing the financial responsibility falling on the British taxpayer.

Referring to the original scheme Lord Salisbury said that in the first three years it would have provided six airships against two under the present scheme. Also under that scheme they would not have proceeded to the second stage unless they had been thoroughly satisfied with the success of the first, and they would not have proceeded to the third unless they had been satisfied as to the second. They would not have been committed to an expenditure of £4,800,000 but only to £400,000. They would not have arranged for the service to India till the Company had produced a service to Egypt. He congratulated the country on the fact that the present Government and the past were in agreement in doing their utmost to make this country the first in the development of airship construction and operation.

[Both in Lord Thomson's speech and Lord Salisbury's much has been said about our "experts," official and unofficial. It seems well at this point to remind the Government that the last airship we ever built was a somewhat ineffective copy of a Zeppelin which was already obsolete when our designs were begun. One does not believe that there is anybody in this country who has any real knowledge of modern airship design. And it is pretty safe to say that the Zeppelin engineers at Friedrichshafen have purposely forgotten as obsolete more about airship design and construction than any of our experts have ever begun to learn. The Americans have taken the very wise course of buying Zeppelin knowledge. It is to be hoped that the Vickers-Shell-Burney group will be equally wise.]

The Duke of Atholl referring to pioneers said that he himself had been one of those who had looked on at the early days of aviation. The pioneers had spent an enormous amount of money and some had lost their lives. He did not suppose that the Noble Lord could mention more than two who had made their fortunes, but he himself could tell of many who went bankrupt and who received no recognition of any sort from the State. [One can mention at least half-a-dozen of the pioneers of aviation who from working at a pound or two a week when they first came into aviation are now the possessors of comfortable houses and even mansions—according to the house agent's definition—and have sufficient fortune to maintain their estates without any assistance from their aircraft works: but it is perfectly true that none of the pioneers of aviation have received any honourable recognition from the State beyond a few O.B.Es.]

Referring to the two schemes the Duke said that he understood that under the Burney scheme £400,000 was to be spent to see if a flight could be made, but under the new Government scheme £1,350,000 was to be spent on an exactly similar scheme. As to the question of monopoly he asked how many offers the Government had got to take over the establishment at Cardington when it was advertised. He did not think there was much keenness to go into a business which would quite possibly lead to financial disaster.

There seemed to be an idea that the Guarantee and Construction Company having a monopoly would be able to bleed the Government. He did not think buyers of airships would be hanging on every bush. The Government itself would probably be the only buyer and would be able to that extent to make its own terms. As to the making of bases he said that in the Navy the bases were made after we had got our ships. He also questioned whether we had got a lease from Zaghul Pasha for the base in Egypt about which a good deal had been heard.

The Lord Montagu of Beaulieu welcomed the scheme on the principle that half of a loaf was better than no bread.

The Earl of Balfour only said :—

My Lords, before the noble Viscount replies, may I ask him one question? I listened with great interest to the picture drawn by the Secretary of State for Air of all the blessings that were to come to this country if his, I will not say his dreams, but his prophecies of the future come true. Among those advantages was a very great increase of employment for the British working man, and a great opportunity for the investment of British capital. Do the Government contemplate, therefore, that all the airships built in the future for commercial purposes shall be built in this country, or do they propose to carry out the true doctrine of Free Trade, and allow other nations to compete in providing us with the necessary fleet of airships which are to perform all these wonders of the future?

The Viscount Chelmsford, on behalf of the Admiralty, said that they wanted airships and wanted them quickly and that as between the Admiralty and the Air Ministry the most amicable conversations were going on between the experts. As to the usefulness of airships he said that the light cruiser had a speed of 20 knots and a visibility of 15 miles. An airship would have a speed of 50 knots and a visibility of 40 miles. Therefore in ten hours a light cruiser could cover some 6,000 square miles whereas in the same time an airship could cover 45,000 square miles.

As against that he pointed out that recently in our Fleet Manœuvres in the Mediterranean aeroplanes and light cruisers were out and the cruisers gave information as to the position of the hostile forces two hours before the aeroplanes gave information. It was an admirable day but apparently there was an indefinable haze in the air. Looking at it from below it appeared that there was no haze at all but from the air it was an impenetrable mist. This showed that we must be careful about coming to hasty conclusions that airships were going to take the place of cruisers.

The Duke of Sutherland (lately Under-Secretary for Air) expressed his pleasure at finding any firm bringing forward tangible proposals. As he read the present policy of His Majesty's Government it seemed that they were starting a system of aerial doles. It seemed to him that the private company at the present moment had the best engineers and experts and so had an advantage over the Air Ministry.

Lord Gorell said that it was clear that the Burney scheme had been jettisoned and replaced by one which was merely an instalment.

Lord Thomson, closing the debate, pointed out that under the Burney scheme it would require profit at the rate of 20 per cent. per annum for 60 years before the Government loan could be repaid. Everybody had claimed to have experts at his beck and call during the discussions and the curious thing was that all the parties had been referring to practically the same experts. The Construction and Guarantee Company had in fact approached members of the Advisory Board who were at the moment in the Air Ministry. The number of experts could be numbered on the fingers of the two hands. There were a certain number of people of the stamp of works-managers and others, but the number was extraordinarily limited. The Air Ministry had just as much power to get hold of these people as anybody else. The lists drawn up by the Guarantee and Construction Company contained names already on the Air Ministry list.

Finally he said that under the Burney scheme if one machine had crashed there would have been £400,000 gone and the Government would not have been ready with anything. Now if one of the first two ships crashed we should still have the experts in Government employ, we should still have the air highway and we should still have the power of employing people and of giving out contracts and we should still have the determination to go on with the resources of a Government behind us.

The Beaumont Cup.

Although no official announcement has yet been made it is understood that the Gloucestershire Aircraft Co. Ltd. will not take part in the race for the Beaumont Cup. The reason is that the machine was to have been fitted with wing radiators but these will not be ready in time for the event. The machine will compete in the Aerial Derby and after that the company will devote themselves to preparing machines for some important events abroad.

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THE AUXILIARY AIR FORCE AND AIR FORCE RESERVE BILL.

As in the matter of the debate on airships in the House of Lords it is necessary to publish a concentrated version of the Debate on the Auxiliary Air Force and Air Force Reserve Bill in the House of Commons on May 22 because of the historical value of certain statements and opinions in the speeches. Purely wrong-headed notions are just as worthy of publication as are the soundest ideas, because they suggest their own antidotes while at the same time giving some indication of the mental calibre of the people who utter them. In both ways they give one furiously to think.

The debate was chiefly of value because it showed that the importance of the Air Force is now recognised by all parties. The ultra-pacifist members apparently did not even attempt to take part in the debate and were absent from the House. The moderate pacifists expressed wholly reasonable opinions. And in consequence the convinced militarists were able to argue moderately and reasonably without exaggerative eloquence. As debates go it was a good debate.

The Debate.

The Under-Secretary of State for Air, Mr. Leach, introducing this Bill with the awkward title said :—

> We have to face the facts as they are to-day. We know that in the unhappy event of war we might have an invading force of aeroplanes in this country at the actual moment of the declaration of hostilities. In so far as I am responsible to this House for the Air Force, I feel that I should be guilty of a gross dereliction of duty if I failed to seek efficiency.
>
> I cannot neglect its equipment; I cannot seek to deprive it of adequate powers to act. Though I hope there may never be another European war, though I disbelieve in wars as a means of righting wrongs or of serving mankind at all, though I fervently hope that none of my Department—splendid young men—will ever be asked to slay or will ever be slain, still I feel that it is only consistent and honest to ask Parliament for powers which are solely for the purpose of rendering the Air Force a still more highly efficient weapon.

He said that in the selection of appropriate stations the first consideration was nearness of engineering population from whom to get skilled mechanics and the second was aerodrome facilities. The scheme had been drawn up in consultation with the Territorial Association and the War Office. The most suitable administration unit might be a large town or group of towns or even two counties. The force was to be a Citizens' Air Force. The reason for having an Auxiliary Air Force and a Reserve Force as well was that both were experimental and they wanted to try them.

Of the Bill he said :

> It forges no new weapon, but merely sharpens an existing one. Above all, it provides no new facilities for offence. It is purely and solely defensive in its character, and it is, therefore, a menace to nobody.

As to his own position he said :—

> What I dislike to have to do, every hon. Member of this House who thinks twice would also dislike having to do. The whole business of defence is a wicked waste of national substance. It is forced upon the world by the disease of international fear. I hope that some day that disease of international fear may be eradicated. It may be the heritage of the League of Nations to destroy that disease and bring about an era of sanity for all people.

[Knowing Mr. Leach's concientious objection to war one can understand his views. The great pity is that a man of his mental ability and education should not be able to recognise the fact that no League of Nations and no system of education can possibly eradicate the warlike nature of the human animal. A Europe disarmed by agreement under the League of Nations and protected only by an International police force would be at the mercy of the first big man who was able to collect a number of warlike Asiatic tribes as did Attila and Genghiz Khan and start a march Westward. Unfortunately Mr. Leach in making his fortune has probably not had time to study ethnology and to realise that the mind of the square-head can never be made to think as the long-head thinks.]

Sir Samuel Hoare, lately Secretary of State for Air, pointed out that the present Bill was formed by a Liberal Secretary of State for Air, developed by a Conservative and was now being proposed by a Labour Secretary. Therefore no Party issue need cross the discussions. It was obvious that as long as there was an air menace an adequate Air Force would have to remain in this country to defend the capital and the great munition works. It was necessary to develop the basis of air defence from a small professional force into something larger to make the knowledge of air defence more general and if possible to extend interest in air defence and the knowledge of air problems as has been done on military lines by the Territorial system.

He admitted freely that he did not believe that these non-regular squadrons could ever achieve the same efficiency as regular units. As the Home Defence Force was to consist of 52 squadrons out of which 13 would be on a non-regular basis he did not think that we were taking any undue risk. The Auxiliary Squadron would be a unit fully established with non-regular officers and men, and with merely the adjutant and one or two regular N.C.Os. such as Territorial units possess. The Special Reserve unit would be one in which one squadron would be entirely regular and the other two squadrons would be maintained on a *cadre* basis to be filled by civilians when brought up to establishment. The more regular character of these Special Reserve units might appeal as being somewhat more military. He thought that the formation of a single command for home defence was a very important step in development.

Captain Wedgwood Benn said that it was vital to comprehend that the Air Force was not an army and not a navy. It had a different outlook and a different mentality and it would not be right to hand over this infant on which such high hopes were set wholly to people whose experience was of marching and counter-marching, camps and tents. Continuing, he said :—

> For instance, the General thinks that you must put all your tents in a row. That is what a hostile airman would like, because if he misses the first tent he will get the other tents when he throws his next bomb. I mention that in order to show that the two conceptions, that of the Army and that of the Air Force, differ.

[It is sometime quite amazing how people who have served during the War can get hold of such erroneous ideas. Capt. Benn has himself dropped bombs, though probably of a primitive kind compared with those which are in use to-day and he probably has had no experience of modern bomb sights. Yet he assumes that a bomb dropped over a line of tents is likely to do more damage than one which is dropped into a higgledy-piggledy mass of shelters. He apparently does not realise that tents are put in a row in order to assist law and order and to facilitate communication within the camp and also to facilitate drainage. It does not seem to occur to him that a bomb dropped along a line of tents is just as likely to miss them to one side or the other as it is to miss one individual tent in a line. The idea of a jigsaw camp á la Wedgwood Benn is distinctly funny. But a mental picture of such a camp does, one fears, give a fairly accurate idea of this distinguished officer's mental lay-out. If so it accounts for a number of the curiously impracticable ideas of which from time to time he delivers himself.]

Captain Brass, who is rapidly making a name for himself as one of the soundest speakers on aeronautical subjects in the House, said he could not see how substituting 13 non-regular squadrons for 13 regular squadrons was going to sharpen the weapon, it seemed more like blunting it. He gathered that a certain amount of saving could be effected and that we hoped to tap the amateur engineering skill of the people of this country, but he wanted to examine more closely what was going to happen. To take Sussex as an example we had Brighton, Eastbourne, Hastings, Chichester, Arundel, Bognor and Littlehampton. In all these the Territorial Force had platoons under officers who lived in the area. If there were yeomanry we would have a troop, with troop headquarters in the bigger towns. How were we going to arrange for Air Force recruits to be taught anything of value in Arundel or Chichester or Littlehampton? We could drill infantry or cavalry but how could we teach people to rig aeroplanes or overhaul an engine and how could we teach a man at Chichester to fly? [Captain Brass' arguments seem very sound but it was unfortunate that he should have fixed on Chichester which is only a couple of miles from Tangmere, one of the finest aerodromes in the country. For other parts of the country his arguments hold good.]

On the subject of machines Captain Brass wanted to be convinced that Territorial aviators were going to be given new machines and not merely old machines thrown away by the Regulars. Also he asked whether if we were going to have amateur air-mechanics we were going to ask officers to risk their lives in aeroplanes rigged by amateurs.

As regards home service he asked whether a pilot ordered to go from London to Paris and back would be considered as flying on home service. He did not say that it was wrong, he merely wanted information on the subject. It was essential that if officers were going to fly we should be permitted to send them abroad, because the only defence against air attack so far as one could see was to go and attack somebody else. It was no use waiting till aeroplanes came over London and then sending out machines to attack.

He did not want to oppose the Bill but if it was an experiment to see whether it worked or not he wanted an assurance that if after a short period the scheme was not developing properly 13 new regular squadrons would be substituted for those now proposed.

Major Burnie said that the lesson of the last war was that men who were ready to defend this country must be prepared to leave this country. It was a mistake to enlist them for home service in time of peace and then say that we wanted them to go abroad when war broke out. He pointed

ROLLS-ROYCE AIR TRIUMPH

An extract from " The Aeroplane " of May 22, 1924

"ON THE AUSTRALIAN TRIUMPH"

"By completing the Circuit of Australia Wing-Commander Goble and Flying-Officer McIntyre of the Royal Australian Air Force have put up a performance which may fairly be claimed as **the finest flight in the history of Aviation.**

" On their arrival at Melbourne on May 19 they had covered **8,568** miles in 44 days, an average of about 200 miles a day, **in 90 flying hours**, or **only a little less than 100 miles an hour** over a course which faced every point of the compass. But they were not out to break records or to ' put up a stunt,' as the modern phrase has it. Their task was to make a rapid survey of the coast of Australia, with a view to judging where coast-defence air stations may best be placed.

" They were not able to devote their time ashore to overhauling their machine and resting ; they had to make notes, write reports, and interview local people as to the topographical and meteorological peculiarities of each locality. They had no prepared aerodromes. They had no prepared bases with spares and facilities for repairs. They just pushed off from Melbourne on a **three-year-old Fairey Seaplane with a Rolls-Royce ' Eagle ' VIII engine**, flew round Australia and did their job.

" Without in any way detracting from such performances as the trans-Atlantic flight or the England-Australia flight, or the England-South Africa flight, or the more recent flight by M. Pelletier d'Oisy to Indo-China, one can say unhesitatingly that **the Australian flight is a better piece of work than any of them.** It has called for a more prolonged effort than some of the great flights of the past, and it has been done without the external assistance and vast preliminary organisation which alone have made the others possible. It was a plain two-man job, and it has won for the Royal Australian Air Force the admiration of all the World's aviators.

" Also, the durability and reliability shown by the Fairey sea plane and the Rolls-Royce engine (both of war-time design and largely of war-time production so far as material is concerned) under the stress of this continued work in tropical sun and rain have **established once more the reputation of English aircraft design and material in the esteem of the aeronautical authorities of foreign nations**, a reputation which must have been considerably shaken by the meteoric success of M. d'Oisy."

Rolls-Royce, Limited, 15 Conduit Street, London, W.1

out for the benefit of Captain Wedgwood Benn that the County Associations were not military bodies at all, they were members of Town and County Councils who as honourable citizens were prepared to assist with the equipment of citizen forces. They were merely assisted by military advisers. He also wanted assurance that the Auxiliary Air Force would be equipped with the most modern aeroplanes and said that he would be prepared to waste money rather than to waste life.

Sir Geoffrey Butler, in one of his usually delightfully literary speeches, congratulated the Under-Secretary on the slightly more martial note that was creeping into his speech. He hoped that Mr. Leach, like the chief character in *Paradise Lost,* having once fallen from grace would take to what was a distinctly uncongenial job with increasing gusto. He wished to put in a plea for the Universities as centres in which it might be possible to plant the beginnings of an air spirit and inaugurate a work which would inevitably spread throughout the country.

Lieut.-Col. Moore-Brabazon thought that some other form of encouragement should be given to the youth of the country to face the joys of getting into the air. He felt that there was going to be difficulty in getting men for the Auxiliary Air Force and he imagined that the members of the Universities, especially Cambridge, who had shown enormous interest in aviation would take it up. He said that there was plenty of good material in the country and added :—

> You can see most of them riding motor-cycles at a hideous speed every Saturday and Sunday, generally with a girl on the back of the motor-cycle. That, of course, is a much more dangerous pastime than any flying. What the Under-Secretary has to do is to get that man off his motor-bicycle and onto an aeroplane, and to let him have the same super-cargo tucked in behind.

He advocated the encouragement of flying light aeroplanes which could be bought at a price varying from £100 to £250. [The Honourable Member is distinctly optimistic. Owing to Government interference light aeroplanes cannot be bought for less than £400 and few young men have so much money to spare.]

He demanded Government support for popular flying competitions and said that he had found the Air Ministry " exceedingly sticky " in such matters.

Captain Berkeley wanted to know the exact meaning of the words " Liable to be called up for service within the British Isles."

Viscount Curzon, in an intelligent and useful speech, asked for relative figures of costs between a Reserve Squadron and a squadron on an active service basis. He also asked whether when units were called up for training it was intended to call out an entire squadron or to call the men out as individuals and draft them into Service squadrons to serve their time. He suggested that if it were possible to study the convenience of the officers and men and so arrange things that they could do their training when they got their holidays we should be much more likely to get the men. He also wanted to know whether these squadrons were to have their own machines or whether the personnel were to go away as individuals and descend upon some active service squadron and use its machines.

Quoting the article which appeared in The Aeroplane recently he pointed out that we have not got in this country in any Service squadron a machine which could catch that used by the gallant Frenchman who is flying across the World, and he called the attention of the House to the fact that our fastest fighting machine on Service could not catch the fastest two-seaters produced in foreign countries. Therefore he wanted to know on what basis the Auxiliary Air Force and the Reserve were to be equipped. He also wanted to know how officers and men of both forces stood as regards life insurance. And he ended by saying that personally he would rather see the Government go straight out for a scheme which would ensure us the necessary number of active service squadrons.

Lieut.-Col. Sir Joseph Nall, in another useful and sound speech, said that he did not see how a pilot trained under any Territorial system was to be ready for immediate defensive purposes when war broke out. He urged the Government to see that the personnel of the Auxiliary and Reserve Forces should be trained by existing regular squadrons and that new machines should not be handed over to untrained units. Further he said that experience of the civil aviation subsidy ought to be sufficient proof that money spent in that way does not provide efficient military organisation. From all the hundreds of thousands of pounds spent something less than a score of pilots and something under a score of aeroplanes had been produced. None of the pilots was under any obligation to serve and none of these aeroplanes could be adapted to military purposes. He also thought that additional funds should be allotted for additional regular squadrons.

Mr. Hardie said that before going into the air a man should demonstrate that he knew everything about his engine. That is to say he should be a first-class engineer before being allowed to drive that engine in the air. He was against encouraging the use of cheap light aeroplanes and said that if we got machines at £250 they would be a sort of Woolworth type. If we wanted to increase our death rate we could do it by Saturday afternoon flying on machines at £250. He characterised the Bill as a niggardly business.

The Earl Winterton said that they should all be grateful for the almost complete absence of pacifists both from the House and from the debate. Mr. Leach's speech was most moderate and reasonable and none would blame him for his own personal views. He suggested that a public speech by the Secretary of State for War or the Air Minister advocating the support for Territorials generally and especially the Auxiliary Air Force would be of benefit.

He reminded Capt. Brass that a man at Chichester could apply at an aerodrome three miles away. He happened to know because he resided in the county.

Mr. Leach in replying on the debate said :

> The Auxiliary Air Force itself, it is proposed, shall consist of six squadrons, and we hope to raise them this year.
>
> The total number of officers who will be enlisted for these six squadrons will be round about 160, and possibly there will be 1,000 men of other ranks.
>
> The Special Reserve Force which this Bill raises is also a limited experiment. We are suggesting certain squadrons for a Special Reserve Force, and this will involve 104 officers and 780 men for home defence purposes solely, so that the House will realise that some of the difficulties which hon. Members have been raising must surely appear rather smaller in view of the size of the experiment itself.
>
> We propose that no officer shall be given a commission in the Auxiliary Air Force except he has learned to fly. I will go further and say in order to enlist the extra number of men who are going into training in order to learn to fly that we are very favourably inclined to consider the question of making them grants for the purpose of covering the cost. Further, we are not proposing to raise any squadrons in areas where, as in Sussex, there is no population.

After a spirited protest by Lord Winterton against this aspersion on his own county **Mr. Leach** said that it was not proposed to raise squadrons in country districts or to employ amateur mechanics. All airmen would be trained mechanics. As to home service he said that if a foreign country was within the capacity of aeroplanes to fly there and back they would do it.

The Light Aeroplane Events.

The majority of important firms are building machines for the light aeroplane competitions. So far as is known at present two-seater machines are being prepared by the following :—

William Beardmore and Co. Ltd., The Bristol Aeroplane Co. Ltd., The De Havilland Aircraft Co. Ltd., The English Electric Co. Ltd., The Gloucestershire Aircraft Co. Ltd., The H. G. Hawker Engineering Co. Ltd., George Parnall and Co. Ltd., A. V. Roe and Co. Ltd., Short Bros. Ltd., Vickers Ltd., The Air Navigation and Eng. Co. Ltd.

Some of these firms are building more than one machine. Mr. Shackleton is designing the machine for Beardmore's but prior to joining that firm he had designed the machine now being built by the A.N.E.C. As last year, the A.N.E.C. are building a second machine for the Addlestone Aero Club.

Most of these machines are being fitted with Bristol Cherubim or Blackburnes. (Note to Blackburne Motors : " Why not call the new engine the Seraph " ?)

Meanwhile there is plenty of work for the single-seaters of last year. There is to be a race with prizes totalling £125 for which they as well as the two-seaters are eligible, on Aerial Derby Day, and also the Grosvenor Challenge Cup which is also open to the single-seaters. This will be run on Sept. 13 over a course from Lympne to Croydon and back and will be open to all machines with a piston displacement of less than 1,000 c.c.

The Parnall Pixie of last year will probably be sent abroad shortly where it will participate in a trans-continental flight which is likely to cause something of a sensation.

Race Prizes.

Sir Charles Wakefield, Bart., has presented £500 and Lt.-Col. F. K. McClean £100 to the Royal Aero Club Racing Fund.

The Committee of the Royal Aero Club has allocated the following sums from the fund :—Aerial Derby £575, Light Aeroplane Handicap £125, The King's Cup £300, Schneider Cup £250, Grosvenor Cup £50.

Mr. Keep's Accident.

Mr. Keep underwent a second operation on May 16 as it was found necessary to amputate his other foot. Since the second operation Mr. Keep has made favourable progress and is now able to receive short visits from individual friends.

Colonel Henderson.

Lt.-Col. G. L. P. Henderson has now joined the De Havilland Aircraft Co. Ltd., as a pilot. Colonel Henderson was a pilot in the service of the Daimler Airway and his refusal to join Imperial Airways Ltd. and his reasons for this were chronicled in The Aeroplane last week.

NATIONALE VLIEGTUIG INDUSTRIE
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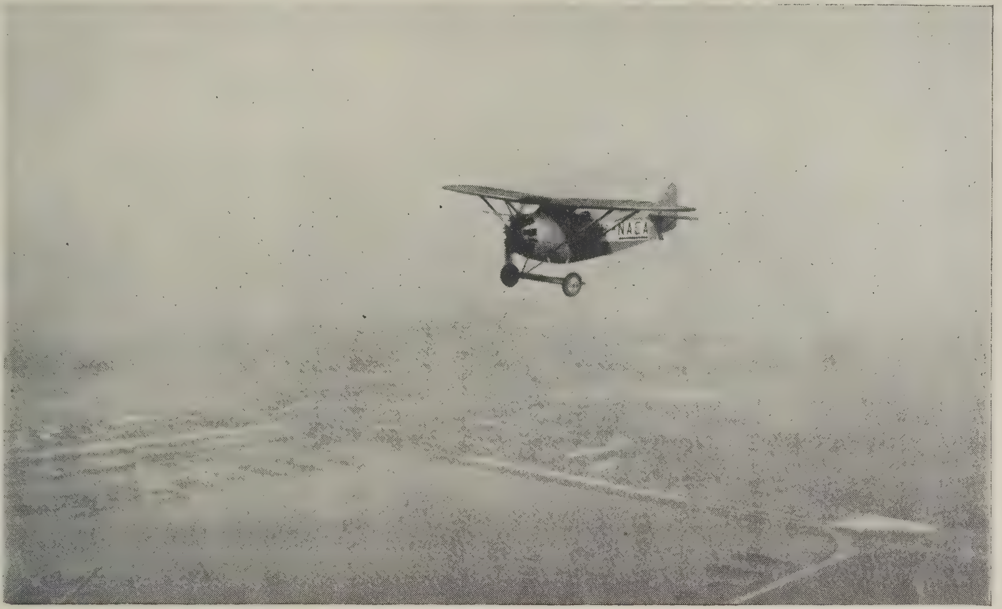

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F.K.31.

Here is the 31st type of machine built to the designs of Mr. Frederick Koolhoven, A.F.R.Ae.S., M.I.Ae.E., M.S.A.E. It is stronger, more controllable, has a better view and a BETTER ALL-ROUND PERFORMANCE than any other Jupiter-engined TWO SEATER FIGHTER. Its military equipment is complete and simple. This machine is adopted by several Governments and is now in full production.

Two other successful machines, F.K.29, a small commercial machine and F.K.23a, a single seater fighter, are *au point* and in production.

A three-engined commercial 10-seater, F.K.33, is now being built.

Write for information to :—

NATIONALE VLIEGTUIG INDUSTRIE,
Head Office: PRINSESSEGRACHT 21, THE HAGUE.
Works: CALANDPLEIN 1, THE HAGUE. Tel. H.4308.
Telegrams: NAVLINDUS, The Hague. Codes: Bentley and A.B.C. 5th Edition.

THE ROYAL AIR FORCE.

The London Gazette.

May 20

General Duties Branch.—The follg. are granted perm. commns. in the ranks stated (May 21):—Sq. Ldr. J. C. M. Lowe. Flt. Lt. P R. T. J. M. I. C. Chamberlayne, A.F.C. Flg. Off. S. N. Webster, A.F.C.

Lt. T. Fetherstonhaugh, K.R.R.C., is granted a temp. commn. as a Flg. Off. on seconding for four years' duty with the R.A.F. (May 15); Plt. Off. E. Reid is promoted to the rank of Flg. Off. (May 19); Flg. Off. F. C. Baker is transferred to the Reserve, Class C (May 21).

The S.S. commns. of the follg. Pilot Officers are terminated on cessation of duty (May 21):—A. G. Everett, H. A Le Feuvre

Medical Branch.—Flt. Lt. T. J. D. Atteridge is granted a perm. commn. in the rank stated (May 21).

Reserve of Air Force Officers.—The follg. officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs.—C. H. R. Johnston (Nov. 8, 1923); W. R. G. Atkins, O.B.E., C. B. Collins, J. V. Hay, H. G. Herbert, C. W. Halfhide, C. Hole, E. C. Hubbard, W. T. Kanaar, W. J. Metcalf, H. W. Roberts, W. A. Syme, L. P. Timmins, C R. H. Trevor, N. W. Wale, C. E. Welsh, W. Woodman (Mar. 18); G G. Green, F. Tymms, M.C. (Apr. 1); R. C. Crawley, G. L. Hunting (Apr. 16).

Plt. Offs.—F. Alien, H. V. Bullock, C. T S. Capel, H. G. Eggar, R. J. Hibberd, C. A. Jamblin, D. A. Watson (Mar. 18); G. Fitz-G. Atkinson (Apr. 1); A. Higham (Apr. 9); J. C. Montgomery (Apr. 13); E. P. Smith (Apr. 30).

May 23.

The award, by His Majesty the King, of the Air Force Cross to Lieut.-Cmdr. (Act. Cmdr.) K. M. Mackenzie-Grieve, Royal Navy, and to Mr. H. G. Hawker, on May 28, 1919, in recognition of their distinguished services to aviation, is hereby published in accordance with the 19th ordinance of the warrant instituting the Air Force Cross.

Wing Cmdr. A. H Jackson is appointed Provost-Marshal and Chief of the Air Force Police (May 12) (Vice Sq.-Ldr. L. L. MacLean).

Appointments.

Week ending May 26.

General Duties Branch.—Air Commodore B. C. H. Drew, C.M.G., C.B.E., to R.A.F Depot on transfer to Home Estab., 12/5.

Group Captain A. L. Goodman, C.M.G., D.S.O., to R.A.F. Depot on transfer to Home Estab., 24/4.

Flight Lieutenants E. H. Richardson, to R.A.F. Depot on transfer to Home Estab., 24/4; C. K. Chandler, M.B.E., to H.Q., India, 9/4.

Flying Officers D. S. Allan, to No. 5 Sqdn, India, 21/4; (Hon. Flt. Lt.) P. N. Melitus, to Aircraft Depot, India, 17/4; R. F. Browne, D.F.C., to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab., 8/5; A. B. Cree and S. R. Boldero, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab., 24/4; L. E. Cutforth, to No. 5 F.T.S., Shotwick, 20/5; T. Featherstonhaugh, to No. 24 Sqdn., Kenley, 15/5; C. V. Lacey, A.F.C., to Aeroplane and Arm. Exper. Estab., Martlesham Heath, 3/6; P. W. Adams, to School of Balloon Training, Larkhill, 22/5

Pilot Officers B. C. Mason, to No. 3 Sqdn., Upavon, 26/5; C. H. Ratcliffe, to No. 60 Sqdn., India, 9/4; A. E. Stewart, to No. 31 Sqdn., India, 21/4.

Medical Branch.—Squadron Leader (Medical) A. J. O. Wigmore, M.B., to No. 3 Group H.Q, Spittlegate, 22/5. Flight Lieutenants (Medical) D. G. Boddie, M.B., to No. 2 F.T.S., Duxford, 16/5; T. L. P. Harries, M.B., to No. 58 Sqdn., Worthy Down, 20/5. Flying Officers (Medical) A. Dickson, M.B., and R. T. F. Grace, M.B., to Research Laboratory and M.O.S. of I., Hampstead, on appointment to S.S. commns., for short course, 19/5.

Stores Branch.—Flight Lieutenant (Stores) W. J. King, D.C.M., to Station Commandant, Iraq, 11/4. Pilot Officer (Accountant) C. W. Cackett, to Record Office, Ruislip, 3/6.

The Independent Force Dinner.

The Annual Dinner of the Independent Force R.A.F. and all officers of Army troops and attached units, will be held at the R.A.F. Club, 128, Piccadilly, W., on June 24, at 7.45 p.m. for 8 p.m. Air Chief Marshal Sir H. M. Trenchard, Bart., G.C.B., D.S.O., A.D.C., will be in the Chair. Group Captain H.R.H. the Duke of York, K.G., K.T., G.C.V.O., has graciously signified his intention of being present. Please bring this notice to the attention of any eligible officers. Tickets, 8s. 6d. (excluding wines), from the Hon. Secretary, Room 546, Adastral House, Kingsway, W.C.2. Evening dress with miniatures.

Major General Sir H. H. Tudor.

The *London Gazette* of May 6 announces that Major-General Sir Henry Hugh Tudor, K.C.B., C.M.G., relinquishes his temporary commission as an Air Vice-Marshal on ceasing to be employed.

Air Vice-Marshal Sir H. H. Tudor has been Officer Commanding in Palestine since 1922. He had a distinguished career during the War 1914-18, and afterwards commanded in Ireland the force know officially as the R.I.C. Auxiliaries, and erroneously, as the Black-and-Tans. Thereafter he was appointed to command the Palestine Gendarmerie, for which he enlisted a number of the disbanded R.I.C. Auxiliaries. At a later date he was appointed to command all British forces in Palestine and as the R.A.F. was the Service to which control had been allocated Sir Henry Tudor was made a temporary Air Vice-Marshal.

Aircraft Apprentices.

The Air Ministry announces that 700 aircraft apprentices are required for entry into the R.A.F. technical schools of training within the next few months. Nearly 800 apprentices have already completed their training and been posted to squadrons as qualified craftsmen, and more than 3,000 are at present undergoing training at Halton, Cranwell, and Flowerdown.

Aircraft apprentices are selected from two examinations, one an open examination conducted by the Civil Service Commissioners, and the other a limited competition conducted by the Air Ministry in conjunction with the local education authorities of the country.

Candidates, who must be physically fit and normally be between the age of 15 and 16½ at the time of entry, should make application, if they are still at school, to their Headmasters. If they have left school application should be made to the Advisory Committee for Juvenile Employment in their area, while boy scouts can also apply to the authorities of the Boy Scout Association and territorial cadets to the Officer Commanding their units.

There is no fee for this examination which is carried out at schools in each area where boys are nominated. The syllabus consists of mathematics, experimental science, English and a general paper.

When appointed as aircraft apprentices boys are given three years' training in a skilled trade and general education by civilian schoolmasters. The principal trades open to boys are carpenter-rigger, fitter, coppersmith, wireless operator mechanic, electrician, instrument maker and turners. In assigning boys to the various trades every endeavour is made to give effect to each boy's individual preference.

During the period of training there is careful supervision of health and general welfare, medical attendance, religious instruction from the chaplains of several denominations, and recreation facilities. The housing conditions and food are good. Six weeks' annual leave is granted.

Pay is given, under existing regulations, at 1s. 6d. a day until the age of 18 and then at 3s. a day until the course is completed. At the end of the course the aircraft apprentice must sit a passing out examination for promotion to the rank of leading aircraftsman with pay varying from 5s. 2d. to 5s. 6d. per day. The above rates may be subject to revision in the immediate future. Those boys who do not qualify for the highest grade will be appointed as aircraftsmen with slightly lower commencing rates of pay.

A certain number of the leading apprentices are sent on completion of their course to the R.A.F. Cadet College for training as commissioned officers. Others are given an advanced course and are eventually appointed N.C.O.'s with the rank of Corporal. There is also a reasonable chance of selection for a further number to qualify later in flying to become airmen pilots.

Headmasters and others interested in the scheme can obtain copies of the regulations for entry (A.P. 134) on application to the Secretary, Air Ministry, Kingsway, W.C.2.

The Gordon Shephard Memorial Essay.

The Air Ministry announces that the Gordon Shephard Memorial Prizes, which are given annually for the best essays submitted by members of the Royal Air Force on subjects selected by the Air Council, have been awarded as follows in the 1923 competitions:—

1st Essay. 1st Prize. Flight Lieutenant J. C. Slessor, M.C.
2nd Prize. Flight Lieutenant J. L. Vachell, M.C.
2nd Essay. 1st Prize. Squadron Leader W. S. Douglas, M.C., D.F.C.

The competition was established as a memorial to the late Brigadier-General G. S. Shephard, D.S.O., M.C., Royal Air Force, who was killed while flying in France.

Another Tribute.

In their account of the opening of the Royal Tournament at Olympia on May 22 the *Times* states:—

> If from recruits little was expected, though much was given, the audience was in the same position with regard to the Air Force. In spite of fairly frequent demonstrations to the contrary, the idea appeared to be that parading is not the *métier* of the airmen. Consequently the fine soldierly movements of the R.A.F. guard of honour had been everywhere remarked as if with surprise. It was the same at Wembley at the opening of the Empire Exhibition.

The Silent Service.

The *Times* of May 22 states:—

> Lieut.-Cmdrs. Gerald Harper and H. M. Montague have this week been lent to the R. A.F. Establishment, Farnborough, for courses, on the conclusion of which they will return to the R.A.F. School of Balloon Training, at Larkhill, near Amesbury, Wiltshire. They were appointed to this School in September last, being the first naval officers of their rank to join it.
>
> In addition to the six naval officers serving in the aircraft-carrier *Eagle* who are borne for observer duties, three more are joining this week—Lieut. H. L. Carslake, F. M. Walton, and E. L. D. Moore, who have recently taken the Observers' Course. The *Eagle* is under orders to join the Mediterranean Fleet.

* * *

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

The Inter-Service Boxing Championship.

The Imperial Services Boxing Championships took place at the R.N. Barracks, Portsmouth, on April 30, May 1 and May 2.

The team placings at the finish of the meeting were: Royal Navy 36; Army 36; Royal Air Force 28; Royal Marines 21.

The results of the finals were:—

OFFICERS.

Feather-weight: Sec. Lt. A. Westcott (R.N.) beat Flt. Lt. H. Walker (R.A.F.) in the first round, the referee stopping the bout.

Light-weight: Flg. Off. L. Whitfield (R.A.F.) beat Pay.-Lt. Glenister (R.N.) in the first round.

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Welter-weight: Flg. Off. S. Mason (R.A.F.) beat Lt. W. Nonweller (R.M.) on points.

Heavy-weight: Sub. Lt. B. Baker (R.N.) beat Lt. C. T. Capper (Army)

OTHER RANKS.

Fly-weight: L/Sjt. C. Fleming (Army) beat AC.2. J. Williamson (R.A.F.), on points.

Bantam-weight: L/Sjt. Patten (R.N.) beat Pte. S. Harvey (Army)

Feather-weight: Sjt.-Ins. W. Hoban (Army) beat A. B. Chadwick (R.N.)

Light-weight: L/Cpl. T. Wigmore (Army) beat Tel. Underwood (R.M.)

Heavy-weight: Str. P. O. R. Spiller (R.N.) knocked out AC.2. Forrester (R.A.F.) in the first round.

Association Football.

R.A.F. v. Army.—The last of the Inter-Service matches was played at the Central Sports Ground, Uxbridge, on Apr 30, when the R.A.F. beat the Army by 4 goals to 1.

The ground was heavy and frequent mistakes were made. The Army XI was a very strong one, including four internationals, the team combined cleverly but made the mistake of keeping the ball too close. The R.A.F. adopted more open tactics. Flg. Off. Spooner (capt.) played a very good game throughout, and his dash had much to do with his side's victory.

The Army were the first to score and this was the only goal of the first half. On Dempsey scoring the equalising goal the tide immediately began to turn in favour of the Air Force and Spooner and Martin soon added further goals. Finally the Army back turned a shot from Dempsey into his own goal.

By winning this match the R.A.F. won the Inter-Services Cup.

The R.A.F. team were as follows:—Flg. Off. G. A. Hadley (Spittlegate), goal; Flg. Off. H. B. Williams (Cranwell) and Sjt. S. Fretwell (Spittlegate), backs; L/AC. Kennett (Uxbridge), Sjt. R. Young (Spittlegate), and Flg. Off J. Spooner (Uxbridge), half-backs; Cpl. E. Francis (Cranwell), Cpl. A. E. Weaver (Halton), Flg. Off. C. N. C. Dickson (Cranwell), AC. Dempsey (Isle of Grain) and Flg. Off. E. Martin (Duxford), forwards.

Inter-Unit Cup Final.

Cranwell v. Manston.—The Inter-Unit Cup Final was played at the Stadium at Wembley on May 2, and resulted in a win for Manston by 3 goals to 2. The conditions were ideal and the turf in splendid order. Quite a large gathering of airmen from both stations were present at the match and witnessed a very open and on the whole evenly contested game. After the conclusion of the game Air Commodore C. Longcroft presented the Cup and medals.

Cricket.

R.A.F. v. Greenjackets.—The R.A.F. played their first cricket match of the season against the Greenjackets at Winchester, on May 21. Owing to rain the match was abandoned. On the result of the play, the R.A.F. held a very decided advantage.

The Greenjackets batted first and scored a total of 53.

R.A.F.—Flt. Lt. C. E. H. Medhurst, c. Todd, b. Darell, 10; Flg. Off. E. Brewerton, c. Darell, b. Constable, 17; Flt. Lt. L. F. Marson, not out, 40; Sq. Ldr. H. Blount, not out, 30; Byes, 2; Total 99.

Flt. Lt. Thornton, Flt. Lt. C. R. Steele, L-AC. Crutchley, Flt. Lt. C. G. Wigglesworth, Flg. Off. B. C. W. Windle, Flg. Off. C. D. Adams, Flg. Off. R. S. Blucke did not bat.

THE GLOBE TROTTERS.

The British Expedition.

The Napier Lion low-compression engine which was despatched from England for Sq. Ldr. MacLaren when he was forced to land at Parlu on April 26 arrived at Calcutta on May 19. This was immediately substituted for the high-compression Lion which was obtained from Baghdad and used for the flight Parlu-Nasirabad-Allahabad-Calcutta.

Owing to the necessity of using a benzol mixture in the high-compression engines it was considered unwise to continue with that engine because of the difficulty of obtaining benzol on some parts of the later stages of the flight.

On May 21 the new engine having been fitted and tested, the Vulture left the Maidan, Calcutta, at 07.15 hrs. for Rangoon. But owing to the torrential rains and strong adverse winds it was necessary to land at Akyab at 11.10 hrs. Before leaving Calcutta Mr. MacLaren had received unfavourable weather reports from the Bay of Bengal where storm signals had already been hoisted and where monsoon conditions will soon be established.

On May 24 Mr. MacLaren left Akyab race-course but five minutes after the start the machine got out of control and crashed in Akyab harbour. The crew were rescued and the Vulture was towed to a dredger by boats to prevent it from sinking. The hull is broken in two and to all intents and purposes the machine is a complete write-off.

It now seems that the only method of continuing the flight will be by using the aeroplane which is now at Tokio. This is now in its cases and can be shipped at once.

It was announced on May 25 that the American officials who are superintending the American World-flight in Tokio have offered to transport this spare Vulture to Nagasaki, retaining it there until official permission is obtained from Washington to take it to Hong Kong where other U.S. destroyers with spare parts for the American aviators are waiting to go to Calcutta.

This offer has been accepted by Lieut.-Col. Broome who is in charge of the flight from Japan onwards to Canada.

This sporting offer of the Americans to assist a friendly rival is very much appreciated and the American Expedition can count on receiving a very hearty reception and every possible assistance when they come within the British zones in India, Iraq and Great Britain.

The Paris-Tokio Flight.

Lieut. Pelletier d'Oisy and Sergt. Bésin who are attempting to fly from Paris to Tokio met with misfortune on May 20. When in landing at Shanghai the Breguet XIX ran into a bunker on the golf course in pulling up after landing and was seriously damaged.

The flight from Canton to Shanghai, a distance of 800 miles, was made in 9¼ hours, and the total distance covered since leaving Paris on April 26 was 10,064 miles, covered in 89¼ hours flying time.

On hearing of the accident M. Laurent Eynac immediately telegraphed to French agents in China urging them to do everything possible to furnish M. d'Oisy with a new machine and a similar request was sent to the O.C. Aéronautique Militaire in Indo-China by the Minister of Colonies.

It is reported in the vague way of the Far East that two Tuchuns or Military Dictators of Chinese Provinces have offered to lend two aeroplanes and that M. d'Oisy has accepted a Breguet 14A2 biplane from the Tuchun of Chekiang.

It is said that from Pekin he will continue his flight from Japan via Mukden, where another Breguet, offered by the Tuchun of Manchuria, Chang-Tsolin, will be ready for use.

The limited petrol capacity of the new machine will necessitate landings for petrol being made either at Nanking or Suchowfu, both in the Kiangsu province. Owing to the Chekiang and the Kiangsu provinces being theoretically at war through personal jealousy between the respective Tuchuns, the Governor of Kiangsu on hearing of the offer made by his pet aversion has forbidden any landing.

An endeavour is being made to remove this impediment but it is understood that whatever happens M. d'Oisy will proceed with his flight.

The American Expedition.

The U.S. Army Round-the-World Expedition consisting of Lieuts. L. H. Smith, L. Wade and F. Nelson, on three Douglas "World-Cruisers" (400 h.p. Liberty engines), successfully crossed the Pacific on May 16-17 having flown from Chicagoff, the westernmost of the Aleutian Islands, to Paramushiru, one of the Kurile Islands just south of Kamchatka, a distance of 850 miles, in 12 hours.

On May 19 they left Paramushiru and arrived at Yetorufu, Staaten Island, a distance of 500 miles in seven hours.

On May 22 they left for Tokio at 05.30 hrs., passed over Kushiro and arrived at Minato at 10.40 hrs. Leaving again at 14.30 hrs. they landed at Kasumigauru Naval Air Station at 17.40 hrs.

Here the machines are to be overhauled and new engines will be fitted so that they will probably stay a week.

On May 24 they travelled by train to Tokio where they were officially received by Gen. Nagaoka, President of the Japan Aviation Society and they also paid official calls at the Army and Navy Departments and were guests at a luncheon given by Gen. Ugaki, the War Minister. They have paid a warm tribute to the help given them by the Japanese.

It now appears that when they were forced to land in the Behring Sea owing to heavy snowstorms in their crossing of the Pacific on May 16, they took refuge in Bolshevik Russian territorial waters. The Bolshevik authorities at Pering Island told them to leave immediately as the United States and the Soviet had "no treaty relations."

Lieutenants Crumrine and Schultz of the U.S. Army Air Service landed at Plymouth on May 24 to prepare the way for the U.S. Aviators. They will equip the bases chosen last summer in Iceland and Greenland and will thereafter superintend the fitting of floats to the American machines when they arrive at the Blackburne Aerodrome at Brough, where numerous large cases addressed to Mr. Crumrine are awaiting his arrival.

The Lisbon-Macao Flight.

Capt. Brito Paia and Lieut. Sarmento Bieres, the two Portuguese military aviators who are attempting to fly from Lisbon to Macao, at the mouth of the Canton River, have purchased a D.H.9 (230 h.p. Siddeley Puma engine) from the Indian Government to replace their Breguet 14A2 which crashed at Pipar, near Jodhpur, on May 7, owing to storms and strong winds.

A national subscription to which all classes and parties have contributed, was opened when the aviators reached Karachi and this has assured sufficient funds with which to purchase a new machine. The D.H.9 which has been chosen has been named the "Portugal," and as soon as it is ready the flight will be resumed.

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THE AIR MINISTRY AND AIRCRAFT PERFORMANCES.

A number of critics belonging to the British Aeroplane Trade have taken objection to the figures given in a table in THE AEROPLANE for May 14 (p. 406) for the speeds of certain British aeroplanes. On the whole these critics appear to have missed the point of the article of which the table in question forms a part. The object of the article was to display the inferiority of British high-speed Service machines when compared with those of other countries, and not to make comparisons between British machines.

In the case of British types which are at present in the hands of the Air Ministry it is not permitted to publish accurate figures. Accordingly for these types figures were concocted. Care was taken to insure that the speeds published should be if anything in excess of the true speed.

In the case of British-built aircraft not supplied to the Air Ministry the speeds given are closely accurate. Therefore the comparison is unfair as between say the Handley Page S.1., the Jupiter Bristol Fighter and such machines as are under the Air Ministry's ban of secrecy. Nor is the order in which the secret machines are shown necessarily correct.

Taken on the whole the British "secret" machines are credited with speeds averaging about 10 m.p.h. higher than the truth—but it is not therefore to be taken that the true speed can be found approximately by subtracting 10 m.p.h. from the speed given.

There is however one case in which a considerable injustice was done to a British machine. The Parnall Plover was placed in the 140/150 m.p.h. class and her speed was definitely understated. To keep within the limits of inaccuracy observed in the case of other similar types the Plover should have been well up in the list of machines credited with a speed of 150 m.p.h. or over.

In the case of the Gloucestershire Grebe the speed is given in the makers' catalogue for the machine with a Jaguar engine as it would be supplied to a foreign power. That speed might differ from that found at the Martlesham test station when loaded with Air Ministry gadgets, and it can be increased by fitting a bigger engine. On the other hand the speed given for the Armstrong Siskin is the speed undoubtedly attained in the King's Cup Race last year by the winning machine, which stripped of gadgets made an average of 148 m.p.h. round the course.

Again, the Jupiter engine being bigger than the Jaguar, it is probable that the speed attained by some of these machines if fitted with a Jupiter would be higher than they would be with the smaller engines. But both the Air Ministry and the makers seem to regard the Jaguar as the normal power-plant for machines which may be discussed in public. The actual difference, however, is less than the inaccuracy of the speeds given.

It is true that the list may give individual members of the British Aeroplane Trade reason to complain that their particular product has been placed in an incorrect position. That is inevitable because no official figures may be published. But it is doubtful whether, if the official figures were published the individual makers would be any better pleased.

The whole point of the table is to show that thanks to Air Ministry policy in complicating design the best British Service aeroplanes have a worse performance than have the best Foreign aeroplanes. If the British manufacturer chooses to sacrifice the ultimate good of the British Trade to his personal *amour propre* by objecting to honest disclosure of our weakness then the Air Ministry can go on its way rejoicing.

The Air Ministry's policy in fact amounts to bolstering up inferior designers with technical help and hampering the progressive ideas of clever designers by subjecting them to the same restrictions as are necessary for the weaker brethren. Thus the tendency is to produce a deadly mediocrity throughout the Trade's products, whereas the only proper policy is to let each firm stand or fall by the results achieved by its finished aeroplanes.

THE WRIGHT T-3 ENGINE.

The Wright type T-3 engine which has been the subject of some considerable discussion in these pages recently, is of the 12-cylinder V type with an angle of 60 degrees between the cylinders.

The engine is designed round a crankshaft which is of particularly large diameter, which is carried entirely in the upper half of the crankcase by seven main bearings. A forged aluminium alloy is used for the caps of these bearings. The lower half of the crankcase serves to carry the pumps and oil strainers, but is otherwise simply an oil sump.

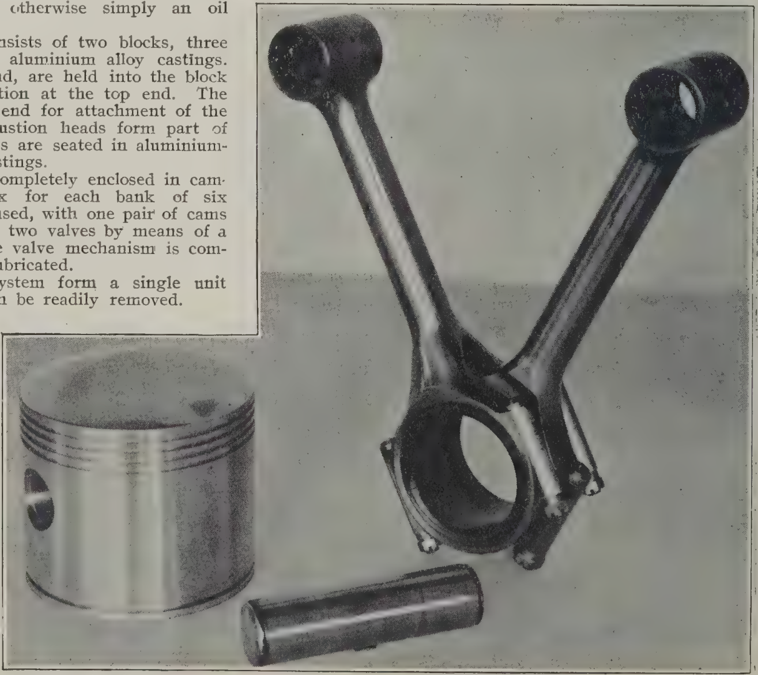
Each bank of six cylinders consists of two blocks, three cylinders each. The blocks are aluminium alloy castings. Steel liners, open at the top end, are held into the block castings by a short-threaded portion at the top end. The liners are flanged at the lower end for attachment of the blocks to the crankcase. Combustion heads form part of the block castings, and the valves are seated in aluminium-bronze rings shrunk into the castings.

The overhead valve gears are completely enclosed in camboxes, there being one such box for each bank of six cylinders. A single camshaft is used, with one pair of cams per cylinder, each cam operating two valves by means of a branched rocker arm. The whole valve mechanism is completely enclosed and pressure lubricated.

The carburettor and intake system form a single unit which is placed in the V and can be readily removed.

All the accessory drives are fitted at the rear end of the engine, and are arranged on the unit system. Oil and water pumps form one assembly, and the camshaft and magneto drives another. All these gears are neatly housed and readily accessible.

It is claimed that with the block cylinder system used a much more rigid engine can be produced than is the case with separate cylinders, that the number of connections,



Piston, Gudgeon-pin, and Connecting Rod Assembly of the Wright T-3 engine.

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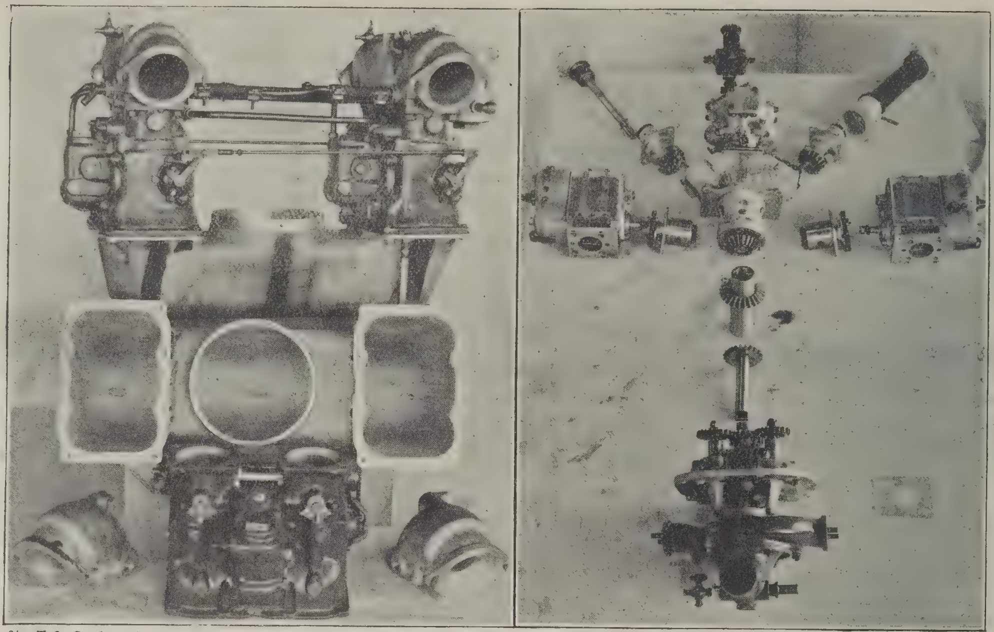
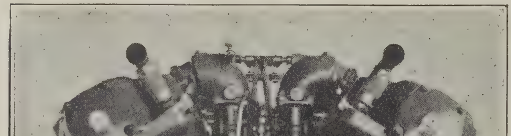


Left, T-3 Carburettors. Foreground, carburettors and twin air-intake, above the complete carburettor assembly. Right, the complete gear lay-out.

particularly in the water system, is considerably reduced, and that it is much easier to dissemble or to reassemble the engine with this type of construction.

Very great care has been taken to make all parts of the engine accessible even when it is installed in an aeroplane—a matter of great importance in operation. All sparking plugs can be reached easily. The oil strainer and oil pressure release in the lower crankcase are easily accessible. The entire ignition system—including the wiring—can be quickly replaced.



Gear-end view of the Wright T-3. The position of the components shown above may be traced from this view.

The number of connections to be made on installation or broken on removal of the engine from an aeroplane has been reduced to a minimum. There is one "oil in" and one "oil out" coupling, one water inlet and two water outlets, a petrol supply joint, and an oil pressure connection.

Both on the camshaft drives and the magneto drives provision has been made to render timing of the engine as simple an operation as possible.

Externally the engine is extremely clean and neat in outline, and there is practically no oil leakage even over very long periods. The engine is economical in both oil and fuel, and in service consumptions of under 0.5 lbs. of fuel per h.p. hour, and under half-a-gallon of oil per hour have been recorded.

The whole engine is built to a complete system of jigs and templates and practically no hand work enters into the manufacture, all bearing fits, etc., being attained by grinding. Consequently complete inter-changeability of parts is secured.

SPECIFICATION.

No. of cylinders	12	
Bore	5-3/4 in. (146 m/m.)	
Stroke	6-1/4 in. (159 m/m.)	
Piston displacement	1947 cu. in. (31.9 litres)	
Compression ratios	5.25 : 1	and 6.5 : 1
Normal output	600	675
Normal speed	1,900	2,000
Fuel consumption at normal power	.48 to .54 lbs./h.p./hr.	
Oil consumption at normal power	.0010 lbs./h.p./hr.	
Maximum output	780 h.p. at 2,200 r.p.m.	
Weight, dry, with carburettors, magnetos, airscrew hub and all necessary equipment	1,155 lbs.	
Weight, with reduction gear and equipment	1,280 lbs	
	Direct Drive.	Geared.
Overall length	58-3/16 ins.	59-1/16 ins.
Overall width	30-7/8 ins.	30-7/8 ins.
Overall height	42 ins.	42 ins.

Dutch Notes.

It is reported that the K.L.M. has placed an order with the Netherlands Aircraft Factory (Fokker) Amsterdam and the National Aircraft Factory (Koolhoven) The Hague, for the construction of a big commercial machine with three engines. Each of the two factories will produce its own design, but in each case three 240 h.p. Siddeley Puma engines are to be used.

On Mar. 25 a new company, called the Netherlands Indian Air Service Co., was established in the Dutch East Indies. This company is reported to have placed an order for four F.K.31 monoplanes (400 h.p. Bristol Jupiter engines) with the National Aircraft Factory, The Hague.

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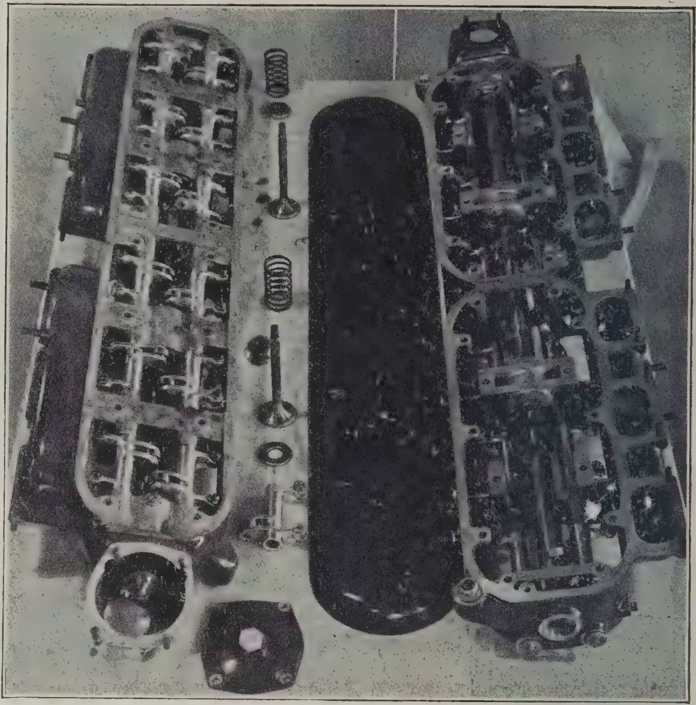

THE VALVE GEAR OF THE WRIGHT T-3.—On the left is seen one cam-gear box complete except for top cover seen from the top. On the right is a similar box seen from the underside, showing the inlet valve ports, cam- and rocker-shafts, etc. Between are a cam-box cover, a rocker arm, valves, valve springs, etc.

A French Competition.

The French Army is to hold a competition for single-seat fighters during the coming summer, at which the first prize is to be an order for between 300 and 400 machines of the most successful type.

In view of the value of this prize it seems to be fairly certain that the French firms which have entered for the Beaumont Cup race will devote the whole of their energies to the military contest and the Beaumont Cup race is likely again to be a fiasco.

A Visit to the N.P.L.

A visit to the National Physical Laboratory has been arranged for the afternoon of Wednesday, June 4. The visit is to start at 3 p.m., at which time all visitors should be assembled at the entrance to the N.P.L.

The most convenient method of reaching the laboratory is by train from Waterloo to Teddington. Trains leave Waterloo at ten-minute intervals.

Will members wishing to attend kindly notify the Secretary of the Institution (60, Chancery Lane, W.C.2) at the earliest possible moment.

Visitors will be able to obtain tea at the Laboratory Canteen at 1s. per head.

An Australian Experimental Station.

An Australian Royal Air Force Experimental Station has been established at Randwick, Sydney. The technical staff at Randwick is under the supervision of Sqdn. Ldr. L. J. Wackett, D.F.C., A.F.C., B.Sc., A.F.R.Ae.S., R.A.A.F., with Mr. H. E. Broadsmith, formerly with A. V. Roe and Co., Ltd., and latterly with the late Australian Aircraft and Engineering Co., as chief civilian engineer.

Randwick will be a small experimental aircraft factory, but quantity production will not be attempted. Designs will be evolved, experimentally developed and tested up to the point of production, when private manufacturers will be asked to tender for further construction.

Physical and Aerodynamic investigations will be conducted at the Munitions Research Laboratory at Maribyrnong near Melbourne, and in the Wind Tunnel at Melbourne University, and full-scale tests will be carried out at the Botany Bay and Mascot aerodromes both of which are quite close. The Randwick site is well equipped with machinery and plant and provides adequate accommodation.

Other problems to be investigated at Randwick are the adequate cooling of aero engines and the recovery of power lost while flying in sub-tropical latitudes, increase of propeller efficiency, deterioration of fabric, glue, ply-wood, etc. under sub-tropical conditions, the uses of home-grown timbers, metal construction, etc.

Considerable importance is attached to the development of the light aeroplane and experimental work in this connection will be undertaken upon the arrival of suitable engines.

The first machine to be built at Randwick is the Wackett "Widgeon" amphibian flying-boat which is now under construction. Among the special features embodied in the Widgeon are folding wings, all-metal ribs, accessibility of the engine, interchangeable planes and struts, protection of airscrew from spray, tropical radiator and detachable undercarriage.

No plywood or glue will be used, the hull will be void of tanks or pipe lines and the machine will carry its own dinghy and lifeboat. Accommodation will be provided for pilot, 3 passengers, 100 lbs. mail matter and 60 lbs. of personal luggage. The maximum speed will be 90 m.p.h. with a cruising speed of 70 m.p.h.

The Department of Civil Aviation has taken delivery of the 6-seater commercial biplane built by the late Australian Aircraft and Engineering Co. Ltd. to the designs of Mr. H. E. Broadsmith and this is now housed at Mascot aerodrome. It was originally fitted with a 400 h.p. Liberty engine, but this has now been replaced by a Rolls Royce Eagle IX.

In addition the following machines have been ordered by the Department of Civil Aviation: One D.H.50 (240 h.p. Siddeley Puma), one D.H.37 (280 h.p. Rolls Royce Falcon) and two D.H. 53s (16 h.p. Blackburne Tom-Tit).

Saunders' "Consuta" Wood.

In future the famous "Consuta" manufactured by S. E. Saunders Ltd. of East Cowes, Isle of Wight, which has hitherto been known as "Consuta" Sewn *Plywood*, will be known as "Consuta" Sewn *Laminated Wood.*

A certain amount of misconception has been produced in the minds of boatbuilders and others interested in this product in terming it *plywood*, which is generally understood as being veneers or thin sheets of wood with the graining placed in opposite directions, the layers being cemented together under great pressure.

"Consuta" is a built-up material, each layer being of specially selected timbers placed in diagonal and opposite directions, afterwards cemented together under great pressure and finally sewn together at regular intervals with hemp thread.

By the method employed in its manufacture it is possible to obtain sheets of "Consuta" in lengths up to 60 ft. and over, by 8 ft width. Such a large area of wood would be quite impossible with any ordinary form of plywood.

The Danish Flying Corps to the Rescue.

Owing to the very hard winter that has been experienced in Denmark between Dec., 1923, and April, 1924, the Danish Army Flying Corps has been called upon to undertake the transport of mail, food, medicine, etc., to many of the Danish islands which have been cut off by ice. When the ice first formed, ordinary transport by steamer was completely cut off, whereupon the Danish postal authorities asked the Flying Corps for help. The carriage of mail was later supplemented by the transport of foodstuffs, medicine and yeast, etc., all of which was very much appreciated by the marooned inhabitants

One of the islands had been without communication with the mainland for over three weeks. On being informed that a mail-carrying aeroplane was about to arrive, their enthusiasm led them to erect an alley of flags and bunting on the only open space available for landing. Owing to ignorance this was set across wind, and the pilot had great difficulty in landing so as to avoid hitting the flag-staffs or damaging his machine. Fortunately the pilot made a good landing, and the flags were duly removed to a safe place for any subsequent landings and takes off.

During the period 877 parcels and 8,785 kilos of food and merchandise were carried by military aeroplanes.

THE D.H. TYPE 50

(230 h.p. SIDDELEY PUMA ENGINE)

THE D.H. Type 50 4-passenger commercial Aeroplane is used exclusively on the new Liverpool-Belfast Royal Mail Air Line, and has been ordered by the three Government-subsidised Air Lines in Australia.

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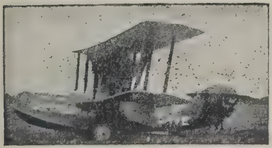

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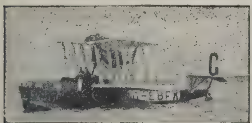
360 h.p. Rolls-Royce.



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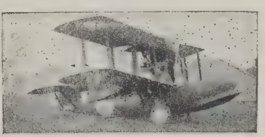
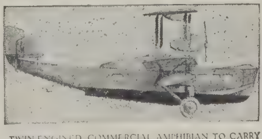
450 h.p. Napier Lion. Winner of the International Race for the Schneider Cup at Naples, 1922.



"SEAGULL" AMPHIBIAN MACHINE.
450 h.p. Napier Lion.



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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 15; Tuesday, 16; Wednesday, 13; Thursday, 13; Friday, 12; Saturday, 5; Sunday, 7.

London—Paris and London—Cologne:
Imperial Airways, Ltd., machines 32, passengers 119, freight —.
Paris-London:
Air Union, machines 29, passengers 109, freight 17,269 lbs.
London—Rotterdam:
K.L.M., machines 15, passengers 38
Special Machines:
De Havilland Hire, machines 2, passengers 4.
Surrey Flying Services, machines 2, passengers 1
Sabena, Handley Page W.8F (Delivery Flight).
Total number of trips by British machines: 37, carrying 124 pas.
Foreign machines: 44, carrying 147 passengers.

Comparative Figures:
For week ending May 25:
Machines, 81; Passengers, 271; Crews, 130; Total personnel, 401.
Corresponding week, 1923:
Machines, 105; Passengers, 353; Crews, 175; Total personnel, 528.
Corresponding week, 1922:
Machines, 162; Passengers, 337; Crews, 198; Total personnel, 535.
Corresponding week, 1921:
Machines, 89; Passengers, 350; Crews, 106; Total personnel, 456.
Corresponding week, 1920:
Machines, 91; Passengers, 138; Crews, 98; Total personnel, 236.

Croydon Notes.

The number of passengers travelling on the Air routes is showing a considerable increase and this week was not far short of three hundred.

Messrs. Barnard, Powell and Robinson have this week been converted to the W.8. The conversion of the W.8 pilots to the D.H.34 school of thought has not been so successful. It has resulted in casualties to two D.H.34s and one lighthouse. One of the 34s ran amok when taxying and made an unprovoked attack on the lighthouse. The second one after being bounced about the livelong day finally sank on its knees after quite a good landing, and lay down and wept as if by the Waters of Babylon. Evidently the previous efforts during the day had been too much for its nerves.

Mr. Muir flew to Paris on Monday and a D.H.9 to pick up a passenger and returned with him in the evening Mr. C. D. Barnard returned from Paris in a D.H.50, whither he had been the previous week. Mr. Alan Butler the Chairman of the De Havilland Aircraft Co. Ltd. returned from his European tour on Thursday having flown from Prague in the day.

It is rumoured that Imperial Airways Ltd. is about to acquire a Vickers Vanguard (two Napier Lions) which is to be equipped as an 18-seater. Also it is said that the ancient Vickers-Vimy "City of London," after being out at grass for a long period, has been humanely slaughtered and is to be stuffed.

A new pilot named Klunder is now flying on the K.L.M. route which is running like a clock as is its wont. The K.L.M. machines will not ascend to-morrow (Thursday) because it is Ascension day, which is a public holiday in Holland.

At the Aircraft Disposal Company's side Mr. Perry has been testing a D.H.9 and a Bristol Fighter. The shops are kept quite busy on the erection of machines and engines.

The Aircraft Disposal Co.'s Football Team.

The members and committee of the Football Section of the Waddon Aircraft Sports Club, together with the works officials and the male staff at Regent House, Kingsway, were entertained at dinner by Lt.-Colonel M. O. Darby, in the Dickens Room, Carr's Restaurant, Strand, on Wednesday, May 4, to celebrate the winning by the team of the Croydon Junior League Cup. Colonel Darby and his guests afterwards visited the Palladium.

This is the first season of the football section and their success in winning the Cup speaks highly for the abilities of the team under the able captaincy of Mr. Kerswill of the Riggers Dept. 16 matches were played in the league, 15 of which were won and 1 drawn. The goals scored were 95 against 10.

Air Mail Stamps.

If any reader has for sale any envelopes and stamps used on any of the Trans-Atlantic Flights or attempts or on any air mails other than regular services, he is invited to communicate with The Aeroplane stating the price required.

PERSONAL NOTICES.

ENGAGEMENT.

WILSON—HEAL.—The engagement is announced between Max W. Wilson, late Captain, R.A.F., only surviving son of Mr. and Mrs. Reginald C. Wilson, of The Hermitage, Bromborough, and Bertha (Betty), youngest daughter of Mr. and Mrs. Albert H. Heal, of Plymyard Manor, Eastham, Cheshire.

MARRIAGE.

ARDLEY—MACRAE.—At the Garrison Church, Lucknow, on April 20, Ernest Lionel Ardley, Flt. Lt., R.A.F., to Isabella Graham, youngest daughter of the late John Macrae, M.D., Murrayfield, Edinburgh.

BIRTHS.

McCLEAN.—On May 23, at 18, Hyde Park Place, W.2, to Aileen, wife of Lt.-Col. F. K. McClean, A.F.C.—a son, stillborn (prematurely).

HILTON.—On May 21, at Yarmouth Rectory, Isle of Wight, to Phyllis, wife of Capt. R. Hilton, M.C., D.F.C., Royal Artillery—a son.

The Cry for Castrol!

Capt. Amundsen orders Castrol for his forthcoming flight to the North Pole.

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THE AEROPLANE

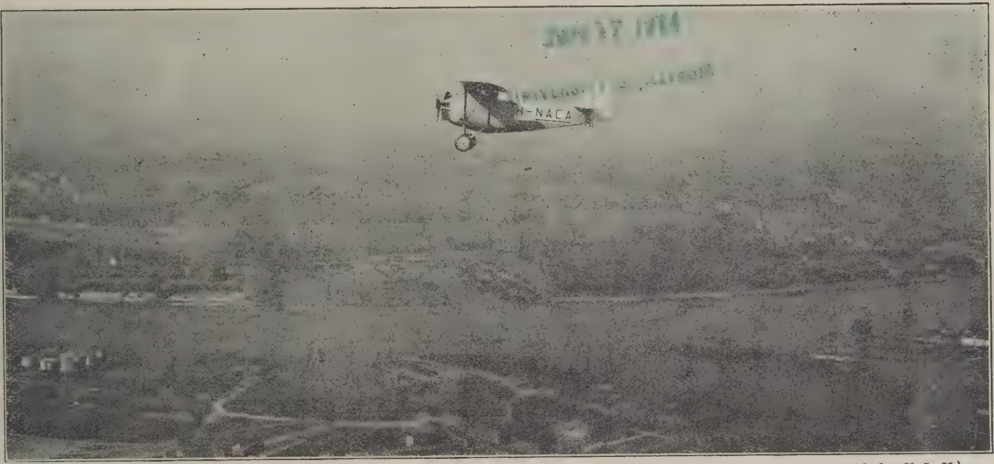
INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXVI. No. 23. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.]

A FLYING DUTCHMAN.

JUN 17 1924



(Photograph by K. L. M.)

HOLLAND'S LATEST TWO-SEAT FIGHTER:—The Koolhoven F.K 31 (400 h.p. Bristol Jupiter engine) flying over Rotterdam Docks.

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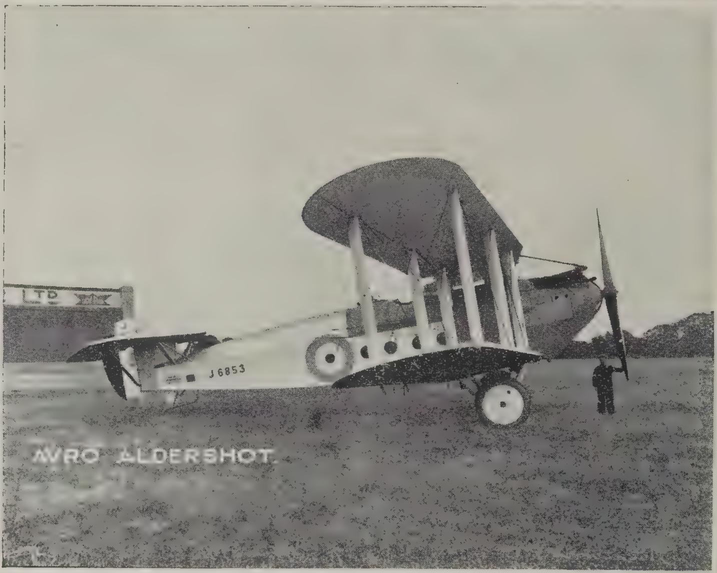

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Further examples of AVRO machines will be shown in this journal from time to time.

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THE AEROPLANE

Incorporating
Aeronautical Engineering

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ON SAFETY FIRST.

A series of interesting experiments which has been made of late by the Management of Imperial Airways Ltd. at Croydon suggests that the motto "Safety First," popularised by the London General Omnibus Company, may be adopted by our State-supported air line. These experiments have not received the attention which their importance deserves so one proposes to point certain morals which may be drawn from them.

For the benefit of those who are only now learning to take an interest in flying it may be well to explain that the flying-stock of Imperial Airways, which has been inherited from the Handley Page and Instone and Daimler lines, consists of Handley Page biplanes of the W.8b type each driven by two Rolls-Royce Eagle VIII engines and De Havilland biplanes of the 34 type each driven by a single Napier Lion engine. The two Eagles combined give about 750 horsepower and carry fourteen passengers and the Lion gives about 450 horsepower and carries 8 passengers.

The W.8bs fly at a cruising speed of about 80 miles an hour and hit the ground when landing at about 40 miles an hour. The 34s cruise at about 90 miles an hour and hit the ground at about 70 miles an hour.

So far as reliability is concerned experience has shown that there is little to choose between the two. There is hardly any appreciable difference between the types so far as the number of forced landings per 1,000 miles flown is concerned—or rather per 10,000 miles flown, for the forced landings are considerably less than one per 1,000 miles. And the absence of serious accidents from such forced landings as have occurred shows that in the hands of skilful pilots there is again little to choose. One forced landing of a 34 had fatal results, and that crash was almost certainly caused by the pilot's lack of skill.

But it is generally recognised among those closely connected with flying that the 34 is a more difficult machine to fly than is the W.8b. And it is obvious that a machine which hits the ground at something over 70 m.p.h. is less safe than one which hits at 40 m.p.h. The faster machine may come to a standstill in a shorter distance than the other when once it is on the ground. But if it hits anything such as a wall or a tree-stump or a ditch when in the act of landing the results must be more serious.

There are other considerations such as the position of the passengers' cabin and the height which the machine stands when on the ground and the speed with which it will turn over if it should trip against an obstruction and the liability of the machine (owing to its wing design) to stick its nose down and dive if the pilot allows it to lose its flying speed when landing. These all enter into the choice of types when safety is considered first. On these points the W.8b is generally held to be superior to the 34. But on the other hand the 34 is faster and is considered by the pilots to be a nicer machine to fly in windy and bumpy weather when once it is off the ground though it is admittedly tricky to get off and land.

Now it is evident that if air lines on a big scale, comparable with shipping lines and railways, are to be successful the flying stock must be such as any ordinarily intelligent pilot can handle. It is clear that when pilots are employed by the thousand as they will be some day instead of by the half-dozen as at present we shall not be able to depend on a constant supply of bright young heroes of the air each of whom combines in himself the qualities of the winner of a Victoria Cross and those of the late Mr. Blondin—and demands a commensurate salary. We shall want and we shall only get intelligent hard-working men who will do a reasonable day's work for a reasonable wage. And these men must only be asked to fly machines which are in themselves safe and simple to handle.

For the further benefit of those who are new to aviation one would emphasise that fact that such machines are now obtainable. By using a multiplicity of engines, say three or four, the probability of a forced landing can be minimised. By using wings the curvature of which can be altered by a simple mechanism (such as has been used on one type of R.A.F. machine for the past six or seven years) the speed of landing can be brought so low that a fatal accident becomes almost impossible even in the worst circumstances. And by applying well-known aerodynamic principles to the design of the machine it is easy to produce an aeroplane which requires no highly-skilled control by the pilot when starting or landing and merely needs to be steered with rather less accuracy than is needed by a motor-omnibus.

So that there may be no misunderstanding and so that one may not be suspected of casting aspersions on the designers of the existing machines used by the air lines one would point out that multiple-engined machines (with four engines) were built by Mr. Handley Page during the War 1914-18 and that convincing demonstrations of slow landings with the help of automatically variable wing-curvature have recently been given by the De Havilland firm—apart from which Fairey seaplanes with wings of variable curve were used by the R.A.F. in 1918 and have been in regular use even since.

It is therefore evident that lack of money is the only possible excuse for the continued use of aeroplanes which are regarded by their own designers as less safe than the machines of later design. And as Imperial Airways Ltd. was granted the monopoly of the Government's million-pound subsidy on the condition that it could guarantee adequate finance to develop air transport in a proper manner it may be assumed that money is no difficulty.

Therefore the directors are not only morally but by agreement bound to sanction the building of a fleet of newer and safer aeroplanes as soon as they can be produced—which could be within the next six months. Thus greater safety may be assured for flying in the bad weather of next Winter if the Board of Imperial Airways Ltd. acts with that promptitude and decision which is expected from business men of such high repute.

The experiments at Croydon to which one has referred all go to prove the need for such a fleet of safer aeroplanes. The first experiment consisted in taking the pilots who had habitually flown the D.H.34s and setting them to fly the Handley Page W.8bs. Though few of them had had much experience of twin-engined machines they all flew the W.8bs without trouble and after a little practice flying round about the aerodrome they were sent off on the cross-Channel service. No mishaps occurred and it was evident that pilots trained for the difficult 34s found the W.8bs an easy job.

For the second experiment the W.8b pilots were set to fly the 34s and then the fun began. These pilots have had on the average quite as much air experience as have the pilots of the 34s and none can say that they are actually less skilful. But evidently years spent in flying the easy-going Handley Pages—one of which was described by a pilot as "a nice confidential old 'bus"—have blunted their finer perceptions. One of the 34s in the hands of a particularly good pilot committed an unsolicited assault on an innocent search-light on the aerodrome and deteriorated itself considerably. Another was so bounced about in the course of a day's experimental landings by a couple of other pilots that in the afternoon its overworked undercarriage went on strike and laid down its tools just like a British workman, leaving the machine lying prone on the grass.

There are several morals to be drawn from these untoward events. One is that obviously an aeroplane which is easy to start and fly and land is safer than one which is difficult. Another is that a pilot should stick to his own machine just as a shoemaker should stick to his last—or as an engine driver when once he is promoted to drive a passenger train sticks not merely to one type of engine but to one individual engine of that type until he is promoted to a newer or faster type and then he serves a fresh apprenticeship as fireman on the new type before he is allowed to drive it.

The third moral is that if the pilots of the admittedly tricky D.H.34s can fly the W.8bs with ease and safety then the pilots of 34s and W.8bs alike will fly with still greater ease and safety on newer machines which are designed in the light of later knowledge to be easier and safer to fly than are the W.8bs. Such newer machines will not only be usable by less skilled pilots but they will so relieve the older pilots (who are now flying) of anxiety and worry that their flying lives will be greatly prolonged. Therefore the fleet of new machines is needed quite as much in the interests of the present pilots as it is of prospective passengers.

Also there is the important point that Imperial Airways Ltd. hopes some day to become a profit-making concern. It can only become so by convincing the Public of all nations that flying is safe. And it cannot prove that flying is safe unless it uses safe aeroplanes.

Only the other day one of the most experienced pilots of D.H.34s hit a war memorial when getting out of a Belgian aerodrome, and, as an aerodrome humorist remarked, the machine behaved like a Swan match guaranteed to strike not only on the box. It went up in flames and the mails which it carried were a total loss. Fortunately there were no passengers, and the pilot escaped. But that incident is not calculated to impress people with the safety of flying.

If Imperial Airways Ltd. fails to prove the safety of flying then it must itself fail. It will find few friends to defend it in time of trouble, for it is open to attack on obviously open flanks. As a State-supported monopoly it is not loved by people in aviation who would like to run air lines themselves and believe that any sound scheme for an air line should receive a Government subsidy. Also, as a State-supported concern it smacks of Socialism in the estimation of Conservative politicians. On the other hand it is backed and directed by wealthy capitalists and so is regarded by Socialists as reeking of Capitalism—a slight indication of this attitude was given when the Transport Workers' Union butted in to support the pilots in their little initial argument with the firm.

Personally one is strictly neutral. One supported the firm's view as against the pilots' because the pilots were obviously in the wrong, both in the magnitude of their demands and in the magnitude of their self-esteem. And these recent experiments go to prove that the Management holds very sound views as to the need for safety first. As between Socialism and Capitalism one sees little to choose. So long as one has a first-class car to drive and a first-class aeroplane in which to fly one cares little whether one has it by virtue of one's position as an official of the State or because one has acquired enough of somebody else's money to be able to buy it. Therefore one can watch the future policy of Imperial Airways Ltd. as an impartial observer concerned only with securing safety first in the operation of air lines as differentiated from air lines which run to schedule times because of the individual skill of the pilots and workshop hands and supply the newspapers at intervals with air tragedies because of the failure of the human element, which to-day has too big a part in aviation.—C. G. G.

The King's Cup Race.

The race for the cup annually and graciously presented by His Majesty the King will be flown on Saturday July 26. The event will be open to both sea- and land-going aircraft. It will be a handicap event but the handicaps will be deducted at the finish of the race instead of at the start owing to the fact that a time might elapse between the start of the limit many and the start of the scratch few in which weather conditions could alter.

The land machines will start at Martlesham and the seaplanes at Felixstowe and the finishing line will be the pier at Lee-on-Solent after which all machines will alight for examination, the seaplanes at Lee and the land machines at Gosport.

There will be no controls en route but machines must pass turning points at Leith, Dalmuir and Falmouth.

The length of the course is 950 miles. Competitors may stop where and when they like for petrol, oil, etc. It will be an advantage for a machine to complete the course without a stop and many competitors will attempt to do this.

Several other prizes in addition to the King's Cup will be offered. The Air Ministry is arranging to broadcast the progress of the race so that shipping on the sea legs of the course will be able to render assistance if necessary.

It is rumoured on unreliable authority that the Committee and Secretary of the R.Ae.C. will fly from Felixstowe to Lee, as it is impossible to see both start and finish by any other means.

Honour for the Aircraft Industry.

It is noted in the Southern Daily Echo that when the Prince of Wales pays his official visit to Southampton on June 27th to open the new floating dock the first industrial institution which he will visit will be the Supermarine Aviation Works at Woolston. As the Southern Daily Echo remarks—"It is particularly appropriate that the Prince should so honour this firm, because it contributes in a large degree to the efficiency of the port of Southampton and represents Southampton's latest industry."

May the Prince's visit be a happy omen for the future of that enterprising firm which from very small beginnings now occupies such a prominent place in international aviation.

The Wilbur Wright Lecture.

The 1924 Wilbur Wright Lecture was delivered before the Royal Aeronautical Society on Thursday May 29th by Lt.-Col. H. T. Tizard. The subject was "Fuel Economy in Flight." The lecturer pointed out that a modern commercial aeroplane operating at 100 m.p.h. on the London-Paris route has to carry fuel equal to about one-half of its paying load and that therefore a reduction in fuel weight of 40 per cent. would mean an increase in paying load of 20 per cent. and that therefore a saving in the fuel consumption is a far more important matter than that of the mere reduction in the fuel bill.

Col. Tizard dealt with his subject in very considerable detail—far too great in fact to discuss at any length at so short a notice as is now available—and concluded—even after having made reservations as to the possibility of improvements in the aeroplane itself which one believes are unduly pessimistic—that it is reasonable to expect the development within a few years of commercial aircraft of such efficiency that air transport will become as commonplace as it was thought to be marvellous when Wilbur Wright first flew twenty short years ago.

The War Minister's Flight.

The Secretary of State for War and Mrs. Walsh left Croydon at 07.30 hrs. on Friday for Cologne on a D.H.34 piloted by Mr. O. P. Jones. After inspecting troops they flew back on Sunday with Mr. Barnard. The weather was very gusty and a landing was made for petrol at Lympne where the party found the D.H.50 on which were the Air Minister and Sir Sefton Brancker. After filling up, both machines flew to Croydon together.

The Prague Aero Show.

On Friday morning Mr. Hubert Broad flew from London to Prague on a D.H.50 with flaps. He carried as passengers Lord Thomson, Mr. Frank Hodges and Sir Sefton Brancker. He returned on Sunday having left Mr. Hodges to continue his journey to a conference at Vienna.

The outward trip was accomplished in 6½ hours, stopping only at Cologne. The homeward trip was made against a headwind and occupied 10 hours. Landings were made at Eger, Cologne and Lympne for petrol.

The trip was highly successful and Mr. Broad says that there is much of interest in the show. The French have a very good exhibit and the number and quality of the uniforms would do credit to any musical comedy.

A report of the show will appear in a subsequent issue of The Aeroplane.

Mr. Alan Butler also flew to Prague on Friday and the D.H.37. He made the journey in 5½ hours. There is also a D.H.53 light aeroplane which has been bought by the Czecho-Slovakian Government. This will be flown by Mr. Broad.

THE PRAGUE EXHIBITION.

In the House of Commons on May 1, in reply to a question by Sir H. Brittain, the Under Secretary of State for Air said that arrangements were being made by the Society of British Aircraft Constructors, Ltd., to secure appropriate accommodation for a representative exhibit by the British Aircraft Industry at the forthcoming aircraft exhibition in Prague. A financial contribution from Air Votes would be made towards the expenses actually incurred.

VISITORS OF STATE.—Lord Thomson and Sir Sefton Brancker arriving at Prague on Friday on the D.H.50 with Siddeley Puma engine. The photograph was brought back by Mr. Broad.

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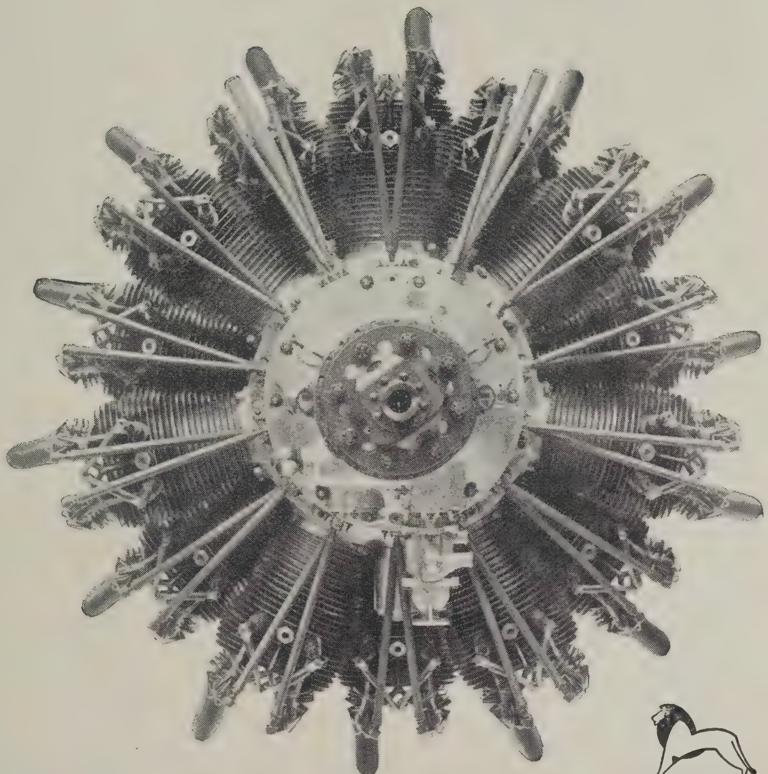

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THE ROYAL AIR FORCE.

The London Gazette.

May 27.

General Duties Branch.—Wing Commander R. G. Blomfield, D.S.O., is placed on the retired list (May 4); Flt. Lt. L J. Killmayer, M.B.E., is granted the rank of Sqdn Ldr. on retirement (May 14); Flg. Off. D S. Buchanan relinquishes his S.S. commn. on account of ill-health, and is permitted to retain his rank (May 28).

Stores Branch.—R. G. A. Vallance is granted a perm commn. as a Plt. Off. on probation with effect from and with seny. of May 19.

The follg. are transferred to the Stores Branch on probation from the General Duties Branch, in the ranks stated, with effect from and with seny. of May 19:—

Flt. Lts.—G. C. Anne, O.B E. (Capt. K.O.Y L.I.); J. S. Browne, A.F.C.; F. H. Sims; H. E. Tansley, M.C. (Lt., Cheshire Regt.). Flg. Offs.—S. R. L. Poole and A. J. Adams.

Flt. Lt. F. R. Berresford is transferred to the Reserve, Class C (May 28).

Medical Branch.—Flt. Lt. S. E. Elphick resigns his permanent commission (May 16).

Reserve of Air Force Officers.—The follg. officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs.—F. J. Bailey, G. Davis, T. P. Isaac (May 27). Plt. Offs..—W. Mullen (May 5); J. Fairbairn (May 6); C. M. Willy (May 10); K L. Graham (May 13); W. George, A. J. Plummer, W .C. Kilvington (May 27).

May 30.

General Duties Branch.—Plt. Off. A. G. S. Tuke is confirmed in rank (May 6). Plt. Off. A. G. S. Johnson is removed from the R.A.F., His Majesty having no further use for his services (May 17).

Appointments.

Week ending June 2.

General Duties Branch.—Squadron Leader A/Grp. Capt. H. C. Ellis, C.B.E., to R.A.F. Depot on transfer to Home Estab., 14/5.

Flight Lieutenants W. Underhill, D.S.C., to No. 216 Sqdn., Egypt, 1/4; H. W. L. Saunders, M.C., D.F.C., M.M., to No. 1 Group H.Q., Kidbrooke, on transfer to Home Estab., 2/6; V. R. Gibbs, D.S.C., to No. 9 Sqdn., Manston, 1/4.

Flying Officers P. W. Adams, to remain at R.A.F. Depot instead of to School of Balloon Training; G. H. Dennett, to R.A.F. Depot, on appointment to a S.S. commn., 23/5; H. E. F. Saunders, to Admiralty Compass Observatory, Slough, 15/6; B. T. Hood, to School of Photography, S. Farnborough, 2/6; L. W. H. Phillips, to R.A.F. Base, Leuchars, 2/6; R. G. Chapell, to R.A.F. Depot, 5/6; M. W. Nolan, to R.A.F. Depot (Non-effective Pool), 1/6; J. R. Brown, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab., 15/5; A. E. Connolly, to No. 99 Sqdn., Bircham Newton, 2/6; W. V. Simons, to Arm. and Gunnery School, Eastchurch, 16/5; A. Sattin, to R.A.F. Base, Leuchars (No. 405 Flight), 31/5; F. P. Smythies, to R.A.F Base, Leuchars, 4/6.

Medical Branch.—Flight Lieutenants (Medical) B. F. Haythornthwaite, M.B., B.A., to No. 20 Sqdn., India, 20/4; J. J. Clarke, to Aircraft Depot, India, 24/4. Flying Officers (Medical) W. J. Hutchinson, M.B., to Aircraft Park, India, 24/4; E. D. Gray, M.B., M.A., to R.A.F. Depot, on transfer to Home Estab., 8/5. Flying Officer (Dental) F. S. S. Whiter, to H.Q., Cranwell, on appointment to a Temp. Commn., 23/5; F. F. Anslow, to R.A.F. Depot, on appointment to a Temp. Commn., 28/5.

Stores Branch.—Squadron Leader (Stores) J. C. E. Gillham, to R.A.F. Depot on transfer to Home Estab, 27/4. Flight Lieutenant (Accountant) Act. Sq. Ldr. F. Binns, M.B.E., to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab, 8/5. Flying Officer (Accountant) R. W. L. Glenn, to No. 208 Sqdn., Egypt, 8/5.

The Birthday Honours.

The following names which appear in the King's Birthday Honours List are concerned with Aviation:—

THE ORDER OF THE BATH.

Royal Air Force.

K.C.B. (Military Division):—Game, Air Vice-Marshal Philip Woolcott, C.B., D.S.O., R.A.F.

C.B. (Military Division):—Blandy, Group Capt. Lyster Fettiplace, D.S.O., R.A.F.

THE ORDER OF THE BRITISH EMPIRE.

The Navy.

C.B.E. (Military Division):—Curzon, Capt. Francis Richard Henry Penn, Viscount, V.D., R.N.V.R., M.P.

Royal Air Force.

C.B.E. (Military Division):—Hearson, Air Comm. John Glanville, C.B., D.S.O., R.A.F.

O.B.E. (Military Division):—Blount, Sqd. Ld. Charles Hubert Boulby, M.C., R.A.F.

Moore, Flt. Lt. Maurice, R.A.F.

Bryer, Flt. Lt. Gerald Mornington, A.F.C., R.A.F.

Holthouse, Capt. (temp. Maj.) John, South African A.F.

M.B.E. (Military Division):—Bruce, Flg. Offr. Robert Samuel, R.A.F.

Whittlesea, Flg. Offr. Ernest, R.A.F.

McKenzie, Obs. Offr. Kenneth Cordell, R.A.F.

Gorwood, No. 302780 Sjt.-Maj. Cl. I. Richard Eric, R.A.F.

Civil Awards.

O.B.E.:—Megarry, Robert Lindsay, Esq., Principal, Air Ministry.

Wood, Ronald McKinnon, Esq., A.M.Inst. C.E., Principal Technical Assistant, Royal Air Craft Establishment, Farnborough.

Colonial Office List.

O.B.E.:—Holthouse, Capt. (temp. Major) John, South African Air Force.

The following in recognition of the valuable services rendered in the recent successful seaplane flight round Australia:—

C.B.E. (Military Division):—Goble, Wing-Cmdr. Stanley James, D.S.O., O.B.E., D.F.C., Royal Australian Air Force.

McIntyre, Flight-Lieut. Ivor Ewing, A.F.C., Royal Australian Air Force.

The King's Levee.

H. M. the King held a Levée at St. James's Palace on June 2.

The members of the Royal Family present included Group Captain H.R.H. the Prince of Wales, K.G., and Group Captain H.R.H. the Duke of York, K.G.

Among those in attendance upon His Majesty was Air Chief Marshal Sir Hugh Trenchard, Principal Air Aide-de-Camp. Group Captain C. L. N. Newall, Aide-de-Camp in Waiting, was among those present.

The Secretary of State for Air was in attendance.

The following officer of the R.A.F. Reserve attended the Levée:—Air Vice-Marshal Sir W. Sefton Brancker.

The following officers of the Royal Air Force were presented to the King:—

Beauman, Sq. Ldr. Eric B.; Bowen, Wing Cdr. James B., O.B.E.; Callaway, Sq. Ldr. William B.; Clarke, the Rev. Sydney L., Chaplain; Goggle, Plt. Off. Cyril K.; Cox, the Rev. John F., M.C., B.A. Chaplain; Crick, the Rev. Thomas, M.V.O., M.A., R.N., Chaplain; Goatcher, Flg. Off. Charles A.; Halahan, Air Commodore Frederick C., C.M.G., C.B.E., D.S.O., M.V.O.; Leslie, Sq. Ldr. Reginald, D.S.O., D.F.C., A.F.C.; Mackworth, Flt. Lt. Philip, D.F.C.; Potts, Flt. Lt Charles; Preston. Flt. Lt. Raphael, A.F.C.; Shield, Flt. Lt. Horace S; Spratt, Sq Ldr. Norman C.; Stevens, Sq. Ldr. George, O.B.E.; Trevethan, Flt. Lt. Richard, M.C.; Wilkinson, Flt. Lt. Frank; Wrigley, Flt. Lt. Noel.

The following officer of the Army was presented:—

Ashmore, Maj.-Gen. Edward, C.B., C M.G., M.V.O., on appointment as General Officer Commanding Territorial Army Air Defence Brigades, by the Secretary of State for War.

The Waziristan Campaign.

H.M. the King has given orders for the following appointments and awards for valuable services rendered in the field in connection with military operations in Waziristan, Jan. 1922 to Apr. 1923:—

The Royal Air Force:—C.B.E. (Military Division), Wing Commander W. G. S. Mitchell, D.S.O., M.C., A.F.C.

M.B.E. (Military Division) Obs. Off. P. J. Hayes, A.F.C.

Mentioned in Dispatches:—Mitchell, Wing Comdr. W. G. S., D.S.O., M.C., A.F.C.; Pearce, No. 206462 Sjt. F. H.; Pritchard, No. 246378 Sjt. O F.; Springham, No. 205852 Sjt. H. W. C.

A Japanese Award.

H.M. the King has given authority for the insignia of the following decoration to be worn:—

Order of the Rising Sun (Fourth Class).—Major Frederick Bernard Fowler, A.F.C., late R.A.F.

Good Wishes.

All concerned with Service Aviation will wish prosperity and happiness to Air Marshal Sir John Salmond on the occasion of his marriage to the charming lady who was until Monday last the Honourable Monica Grenfell. An account of the wedding appears in the Personal Column of this paper.

H.M.S. Eagle.

Having completed the trials and training service required by the Air Ministry, the aircraft carrier *Eagle,* which is the biggest vessel of her class in the Royal Navy, left Portsmouth on Saturday for the Mediterranean, where she will be joined later by the *Argus*.

Originally laid down as a battleship for Chile at Elswick in 1913, the vessel was purchased by the Admiralty in 1917, and has been converted into a carrier at Portsmouth at a cost of over £4,000,000.

The Independent Force Dinner.

The Annual Dinner of the Independent Force R.A.F. and all officers of Army troops and attached units, will be held at the R.A.F. Club, 128, Piccadilly, W., on June 24, at 7.45 p.m. for 8 p.m.

Air Chief Marshal Sir H. M. Trenchard, Bart., G.C.B., D.S.O., A.D.C., will be in the Chair. Group Captain H.R.H. the Duke of York, K.G., K.T., G.C.V.O., has graciously signified his intention of being present.

Please bring this notice to the attention of any eligible officers. Tickets, 8s. 6d. (excluding wines) may be had from the Hon. Secretary, Room 546, Adastral House, Kingsway, W.C.2 Evening dress will be worn with miniatures.

The Dunkerque Dinner.

It is proposed to hold the annual dinner of the R.N.A.S., Dunkerque, and 5th Group, R.A.F., at the R.A.F. Club, on Wed., June 25, at 7.30 p.m., when Air Commodore C. L. Lambe, C.B., C.M.G., D.S.O., will take the chair.

Will those officers who wish to attend kindly communicate with the above-named officer, Halton Camp, Bucks. The price of the dinner will be 12s. 6d. per head.

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EXHIBITION

To Scottish Airmen.

Scottish ex-airmen are informed, that under an agreement, made between the Air Ministry and the Commissioners of the Queen Victoria School, Dunblane, the sons of Scottish ex-airmen are eligible for admission to the above school, and applications should be sent in the first place by letter to the Secretary, the Royal Air Force Memorial Fund, 7, Iddesleigh House, Caxton Street, London, S.W.1, for consideration and submission to the Air Ministry.

Some Personal Notes.

The appointment of Air Vice-Marshal Philip Game, C.B., D.S.O., to be a K.C.B., will be welcomed by all who have served with him in the Air Force. He came to the R.F.C. from the General Staff in the middle of the War and entirely reorganised the staff work of the R.F.C. in the field. After the War he did valuable work in the Personnel Department at the Air Ministry and later was sent to India to reorganise the Air force, which by then had become a public scandal. This work having been accomplished satisfactorily he returned to the Air Ministry and last year was appointed Air Member for Personnel on the Air Council. Everybody will congratulate Sir Philip on his new honour which is regarded as a step towards greater responsibility in the Air Force in the future.

Group Captain L. F. Blandy who receives a C.B. is Director of the Signals Branch of the R.A.F. He left the Air Force some two or three years ago and was appointed to the Department of Civil Aviation to organise signalling, more particularly the development of wireless communication between aircraft and the ground. Last year he came back to the Air Force as a Group Captain to do similar work for the Service. His excellent work both for Service and Civilian flying has thoroughly earned his decoration.

The award of a C.B.E. (Military Division) to Air Commodore J. G. Hearson, C.B., D.S.O., is presumably a recognition of his excellent work in connection with training at home and more recently as chief Staff Officer to Sir John Salmond in Iraq.

Wing. Cdr. Goble and Flg. Off. McIntyre receive Military C.B.E.s for their flight round Australia. The award may be taken as an index of the progress of flying. As one has remarked, their performance may reasonably be claimed as the finest flight in the history of aviation, but whereas those who have accomplished previous flights have been made Knights these officers have to be content with being made Companions of the Order of the British Empire. The difference may be explained by the fact that their flight was done on Service, hence their being appointed to the Military Division, whereas the others were personal adventures. But the appointment also indicates that a great flight to-day must be very much greater than anything previously accomplished if it is to earn the higher awards.

The London Gazette notifies the fact that Wing Cdr. R. G. Blomfield, D.S.O., is placed on the retired list. As a Major in the R.F.C. Wing Cdr. Blomfield raised the famous 56 Squadron which was recognised during 1917 as the crack single-seat fighter squadron of all the belligerent armies. It was in fact our opposite number to the famous Von Richthofen Circus. A great deal of the story of 56 is told in the late Major McCudden's book "Five years in the R.F.C.," though for some strange reason the history of 56 Squadron has never been written although later squadrons with less brilliant reputations have published complete records of themselves. In spite of its fighting accomplishments 56 was perhaps best known in the R.F.C. for its band and it is historically true that when forming the squadron Major Blomfield used to scour the country from station to station in an R.F.C. tender carrying spare mechanics which he exchanged with neighbouring squadrons for mechanics of similar technical quality who also happened to be instrumentalists. After the War he became Director of Recruiting and did much valuable work. He will be distinctly a loss to the R.A.F.

Flt. Lt. L. J. Killmayer, M.B.E., who retires with the rank of Squadron Leader, will also be greatly missed. He was one of the early naval personnel to be appointed for service with aircraft. As Artificer Engineer R.N. he served on the inspection staff at the Admiralty. During the War he did good work on the technical side of the R.N.A.S. He was promoted to commissioned rank and since the War has been employed at the Air Ministry in the Directorate of Equipment.

The Royal Canadian Air Force.

During April of this year an annual gathering of air station officers of the Royal Canadian Air Force was held at Ottawa. Col. J. L. Gordon, Assistant Director of the R.C.A.F., acting as Chairman of the Sessions at which the policy of the force and the programme for the season were discussed. Commanding officers of seven units were present.

The policy of the R.C.A.F. is understood to favour development along purely military lines, but the force is unique among the various branches of the militia service in that it is practically self-sustaining. Through the practical work which it accomplishes for other departments of the Government, it is in receipt of revenue which no other militia unit acquires. At the same time it is a nucleus of an important defence force.

Fourteen new machines will be built for service this year. Eight Vickers Vikings (360 h.p. Rolls-Royce Eagle IX engines) are under construction by the Canadian Vickers plant at Montreal. Six Avro Viper single-seater seaplanes (200 h.p. Viper engines) are to be assembled at Camp Borden. One and possibly two Vikings will be delivered to Jericho Beach Air Station, Vancouver, by July, and the Avro Viper seaplanes will all be completed in time to be used on forest patrols in Ontario this summer.

The R.C.A.F. is planning to start training of cadets for pilots at Camp Borden this summer. The recruiting will be carried on through the Universities of the Dominion. Recruiting for men has also been opened at Vancouver. Men enlisting must sign on for 3 years' general service, with re-engagement for similar periods up to the pensionable age.

The Air Force Club of British Columbia.

A Flying Services Reunion Dinner was held at Vancouver on Apr. 1 and was a great success. The result of it was a rally of ex-R.A.F. people two weeks later and the formation of an Air Force Club.

At the rally, which was for ex-Service pilots and observers, at the Jericho Air Station on Apr. 13 nearly 100 turned out and of these a dozen drawn by lot were given flights in the Curtiss H.S.2L. and the Rolls-Royce Viking stationed there.

The Air Force Club of British Columbia, of which the secretary is Captain Leonard Miller, formerly of 55 Squadron and author of The Chronicles of 55 Squadron, has now reached a membership of fifty and has its headquarters at Jericho Air Station.

The organisation meeting was held on Apr. 29. Major Duncan Bell-Irving (late 60 Sqdn.) was elected president and Major L. R. Andrews vice-president. A strong board of directors includes Squadron Leader A. E. Godfrey of the Royal Canadian Air Force. Besides Capt. Miller, Capt. Tanqueray, D.F.C., and Lieut. George Gorrill also formerly of 55 Squadron are members of the club. Lieut. Gorrill is now a technical flight-serjeant at Jericho Air Station.

Keen co-operation with the club has been shown by the officers of the R.C.A.F. and the General Staff at Victoria. Members of the club as officers of the R.C.A.F. Reserve will be given every opportunity of flying.

Major-General L. C. Goodeve of the Canadian Army General Staff at Victoria was present at the meeting and assured the members of every encouragement from the authorities on behalf of whom he spoke.

Australian Air Defence.

In a discussion on Air Defence held recently in the House of Representatives, Melbourne, a five-year minimum programme costing £750,000 was suggested, of which the following is a précis :—

The Training School at Melbourne already established should be fully equipped, and the aeroplanes presented to Australia by the British Government some five years ago be re-conditioned, with the exception of the single-seater fighters which should be replaced by new materiel.

The work proposed at the seaplane base should be begun immediately.

Army co-operation units equipped with aeroplanes presented by the British Government should be established at Melbourne and Sydney, each of one squadron of 12 machines. Brisbane, Adelaide and Perth should each have a flight of four machines with a nucleus of a citizen Air Force and provision for the training of pilots.

Naval co-operation units should be provided at Sydney with six seaplanes for the new cruisers and six flying boats with six additional seaplanes for Albany, Newcastle and Torres Straits and six seaplanes or flying boats for coastal submarine patrol.

There should be fourteen modern single-seater fighters for training purposes, four each at Melbourne and Sydney and two each at Brisbane, Adelaide and Perth.

Twelve torpedo dropping aircraft of standard type and new bombing machines should be provided.

Cootamundra N.S.W. is suggested as a mobilisation depôt as there is direct railway communication with Albury, the junction at the frontier of New South Wales and Victoria where the various railways which are built to different gauges meet. Thus there would be no retrucking of equipment for Sydney or Brisbane.

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THE GLOBE TROTTERS.

The British Expedition.

With reference to the accident to the Vulture recorded in The Aeroplane of last week the following cable from Sqdn. Ldr. MacLaren has been received by *The Times* under the date 27.5.24 :—

> The accident was due to the machine being waterlogged by torrential rains, causing over-expansion and sogginess after the contraction caused by the heat of the Sind Desert and continual exposure to extreme conditions.
>
> We took off the aerodrome at Akyab at 11.05, and with difficulty cleared the tops of the trees with the engine running well, but when over the sea, we found the machine dropping at 75 miles an hour, too fast to alight on the water, so we throttled down when 50 ft. up, but the machine dropped like a stone and smashed in the bottom of the hull. The water poured in, and there was just time to get on to the tail before the nose became completely submerged. We saved only a dispatch-case.
>
> A rowing-boat came to the rescue, but the machine, although almost completely submerged, continued to float until beached in six feet of water on a spot which is dry at low tide. The engine was undamaged. All the instruments, cameras, etc., except the compass, were completely ruined. I propose to wait for the spare machine from Tokyo, and then to carry on with the flight. All are quite fit and are anxiously awaiting the spare machine.

The spare Vickers Vulture which arrived at Tokio on the Canadian mine-sweeper, "Thiepval," was placed on board the U.S. destroyer, "Paul Jenes," on May 29 and left for Hong Kong the same day. It was due at Hong Kong on June 2, when it was to have been transferred to another U.S. destroyer that is carrying stores for the use of the American Expedition in India, and transported to Akyab, where it should arrive on June 7 if the weather is favourable.

The Paris-Tokio Flight.

[Note :—One understands that the correct spelling of the family name of the gallant French officers is Peltier Doisy and none of the other versions which have appeared in The Aeroplane and other papers is correct.

M. Peltier Doisy who was flying at Cowes in the last Schneider Cup Race is a naval officer and a cousin of the Army officer who is now flying to Tokyo.]

Lieut. Peltier Doisy was due to leave Shanghai for Pekin on May 27 on the Breguet biplane lent him by the Tuchun of Chekiang. This departure was delayed as it was found that the engine of this machine shows signs of heavy wear and it was decided to instal a new engine.

In the meantime, the Tuchun of Kiangsu informed the French Consul-General at Shanghai that if Lieut. Doisy landed at Nankin or Hsuchow-Fu, both in the province of Kiangsu, and both places where it was decided to land to refuel, the aeroplane would be confiscated. This state of affairs is due to jealousy between the neighbouring Tuchuns.

Marshal Tsao Koun and the Minister of War, Lu Chin, then telegraphed to the Military Governor of Kiangsu insisting that he should not raise any obstacles to the flight. Although Lieut. Doisy was determined to carry on according that he should not raise any obstacles to the flight. cided that it was inadvisible to risk an international incident that might prove much more serious than the mere seizure of an aeroplane.

On May 29 Lieut. Peltier Doisy left Shanghai at 05.30 hours and landed at Nanyuan Aerodrome, Pekin, at 17.45 hours. Although he scorned landing at Nankin, he refuelled at Hsuchow-Fu so that it appears that Mr. Chih Hsieh-Yuan Tuchun of Kiangsu either was overawed or else developed a sporting feeling at the last moment.

The flight from Shanghai to Pekin, roughly 700 miles, proved to be very exhausting owing to the extreme heat and the unsuitability of the machine for long-distance flying.

Lieut. Doisy left Pekin at 06.00 hours on June 2 and reached Peitaiho at 07.50 hours, where he refuelled, leaving again at 08.50 hours and arriving at Mukden at 11.00 hours. The time of his departure for Tokio is not yet settled.

The Lisbon-Macao Flight.

Capt. Brito Paia and Lieut. Sarmento Beires, of the Portuguese Army, who are attempting to fly from Lisbon to Macao, have purchased a D.H.9a from the Royal Air Force in India, to replace their Breguet 14.A.2 which was seriously damaged at Pipar, Jodhpur State, in a storm of wind.

On May 29 they successfully tested the D.H.9a and on May 31 they flew from Lahore, where the machine was obtained, to Ambala, a distance of 160 miles.

On May 31 they left Ambala at 05.30 hours and arrived at Allahabad at 10.15 hours, covering the 520 miles, assisted by a following wind, in remarkably good time.

On June 1 they left Allahabad for Calcutta at 05.15 hours, where they arrived later in the day.

The D.H.9a is loaded with spares which include a complete undercarrieg with axle and wheels, an airscrew, batteries, engine spares, and an extra petrol tank. The third member of the crew, a mechanic, has been left behind, as has most of the pilots' personal luggage.

PERSONAL NOTICES.

Marriage.

SALMOND-GRENFELL.—The marriage took place at St. Margaret's, Westminster, on June 2, of Air Marshal Sir John Maitland Salmond, K.C.B., C.M.G., C.V.O., D.S.O., son of Major-General Sir William Salmond and the late Lady Salmond, to the Hon. Monica Grenfell, elder daughter of Lord and Lady Desborough.

The Bishop of Norwich officiated, assisted by the Rev. H. Viener, Chief Chaplain, R.A.F., and the Rev. F. G. A. Phillips, rector of Taplow, and Air Vice-Marshal Sir Geoffrey Salmond was best man to his brother.

Those present at the ceremony included:—Lady Desborough, the Hon. Ivo Grenfell, Sir William and Lady (Geoffrey) Salmond, the Duke and Duchess of Portland, Katharine Duchess of Westminster, the Duchess of Westminster, the Duke and Duchess of Sutherland, Wing Cmdr. and Mrs. G. Grenfell, the Marquess and Marchioness of Salisbury, the Marquess of Londonderry, the Marchioness of Hartington, the Marchioness of Linlithgow, Hersey Marchioness of Linlithgow and Lady Mary Hope, the Countess of Londesborough, the Countess of Dalkeith, the Dowager Countess of Antrim, the Dowager Countess of Airlie, the Earl and Countess of Rosslyn, Countess Beatty, Earl Balfour, the Earl and Countess of Minto, the Dowager Countess of Leicester, the Earl and Countess of Plymouth, the Dowager Countess of Plymouth, the Countess of Ilchester, the Earl and Countess of Midleton, the Earl and Countess of Kenmare, Grace Countess of Wemyss, the Countess of Wemyss, the Countess of Pembroke, Viscountess Milner, Viscountess Ednam, the Spanish Ambassador and Mme. Merry del Val, the Swiss Minister and Mme. Paravicini, Major-General the Hon. Sir William and Lady Katharine Lambton, Lady Morvyth Benson, Wing Cdr. J. R. and Lady Clare Smyth-Pigott, Captain and Lady Victoria Bullock, Lady Moira Lyttelton, Lady Angela Forbes, Lady Henry Seymour, Lord and Lady Charles Bentinck, Lady Violet Astor, Lady Violet Benson, Lady Honor Bridgeman, Sir Harry and Lady Margaret Graham, Lord and Lady Edward Grosvenor, Lady Mary Stewart, Lady Kylsant, Lord Knaresborough, Field-Marshal Lord Grenfell and the Hon. Nina Grenfell.

The Hon. William and Lady Beatrice Ormsby-Gore, Lord and Lady Boston, Lady Algernon Gordon-Lennox, Lady Cynthia Mosley, the Hon. Ivan and Mrs. Hay, the Hon. Mrs. Guy Charteris, the Hon. Mrs. Gideon Murray, the Hon. Mrs. Charles Grenfell, the Hon. Mrs. Arthur Somerset and Miss Somerset, the Hon. Charles and Mrs. Irby, Major the Hon. Maurice Baring, the Hon. John and Mrs. Boyle, Major the Hon. Lionel and Mrs. Tennyson, the Hon. Arnold and Mrs. Keppel, the Hon. Lady Meux, Lady Horner, the Hon. Mrs. Lascelles, and the Hon. Lady Wilson.

Lord and Lady Chesham, Lady Glentanar, Lady Wolverton, Minnie Lady Hindlip, Lady Hylton, Major and Lady Susan Birch, Mr. Herbert and Lady Cynthia Asquith, Lady Mary Strickland, Lady Joan Peake, Lady Victor Paget, Lord Revelstoke, Lord and Lady Mildmay of Flete and Miss Helen Mildmay, the Dowager Lady Nunburnholme, Lord and Lady Apsley, Lord Thomson (Secretary of State for Air), Lady D'Abernon, Lady de Trafford, Lady (Ian) Hamilton, Lady Colefax, Sir Walter Nicholson, Sir Arthur and Lady Crosfield, Lady Bonham-Carter, Sir Quintin and Lady Brand, Sir Charles and Lady Wakefield, Lady Troubridge, General Sir Archibald and Lady Hunter, Sir Arthur and Lady Cope, Lady Leslie, Lady Kimber, Air Chief Marshal Sir Hugh and Lady Trenchard, Sir George and Lady Duckworth-King, Sir Maurice and Lady de Bunsen, Sir Alfred and Lady Knox, Air Vice-Marshal Sir Vyell and Lady Vyvyan, Mr. and Mrs. Austen Chamberlain, Mr. and Mrs. Asquith, Mrs. Lloyd George and Mrs. Carey Evans, Mrs. Henry Loder, Mrs. Seymour Grenfell, Mr. and Mrs. Charles Leslie, Mrs Keith Menzies, Mr. H. A. L. Fisher, Captain Sidney Herbert, Mr Michael Herbert, Mr. and Mrs. John Darwin, Mrs. Arthur Longmore, Air Vice-Marshal Scarlett, Mrs. Euan Wallace, Mrs. Arthur Sassoon, Mrs. Leopold de Rothschild, Colonel and Mrs. Harry Lindsay, Mr. Percy Noble, Mrs. Layton Mills, Mr. and Mrs. Charles Mills, Miss Kerr-Clark, Mrs. Kingscote, Colonel and Mrs. Montagu Brown, Air Vice-Marshal Brooke-Popham, Colonel Du Pré, Mrs. Walter Salmond, Wing Cdr. and Mrs. Maclean, Mrs. Dudley Ward, Colonel and Mrs. Maynard Smith, Mr. and Mrs. Stanley Machin, Major and Mrs. Athill, Colonel and Mrs. Cheyne, Mr. and Mrs. Christopher Aylmer, Air Commodore and Mrs Webb-Bowen, Mr. and Mrs. G. Pascoe Grenfell, Mr. Ulric Verney, Mrs. Colin Campbell, Air Commodore and Mrs. Halahan, Air Commodore and Mrs. Longcroft, Captain and Mrs Marson, Captain and Mrs. Andrew Kerr, Major and Mrs. John Kerr, Captain and Mrs. Salmond, Colonel Bersey, Group Captain and Mrs. Vesey Wells, Group Captain and Mrs. Brooke, Mrs. Riversdale Grenfell, Mrs. Hebden, with Miss Joyce Salmond (daughter of the bridegroom).

The Duke and Duchess of Sutherland lent Hampden House for the subsequent reception, which was notable for the number of officers present who joined the Flying Services before the War 1914.

Many Air Force officers were at the ceremony and a number of them in full dress formed an arch with their swords as the bride and bridegroom left the church, the band of the Royal Air Force meanwhile playing the Wedding March from "Lohengrin." The exit was lined by airmen.

Engagements.

ALCHIN—WRENSTED.—The engagement is announced between Gordon Alchin, of the Middle Temple, Barrister-at-Law, son of the late A. H. Alchin, M.I.N.A., and Mrs. Alchin, and grandson of the late John Alchin, of Rust Hall, Tunbridge Wells, Kent, and Sylvia, youngest daughter of Mr. and Mrs. T. H. Wrensted, of 11, Inverness Terrace, W.2.

Births.

CASSIDY.—On May 26, at Wistwood, Reigate, to Barbara, wife of Flt. Lt. J. R. Cassidy, R.A.F.—a daughter.

CHATTAWAY.—At Manchester, on May 31, to Anita, wife of Capt. H. W. Chattaway, A.F.C.—a son

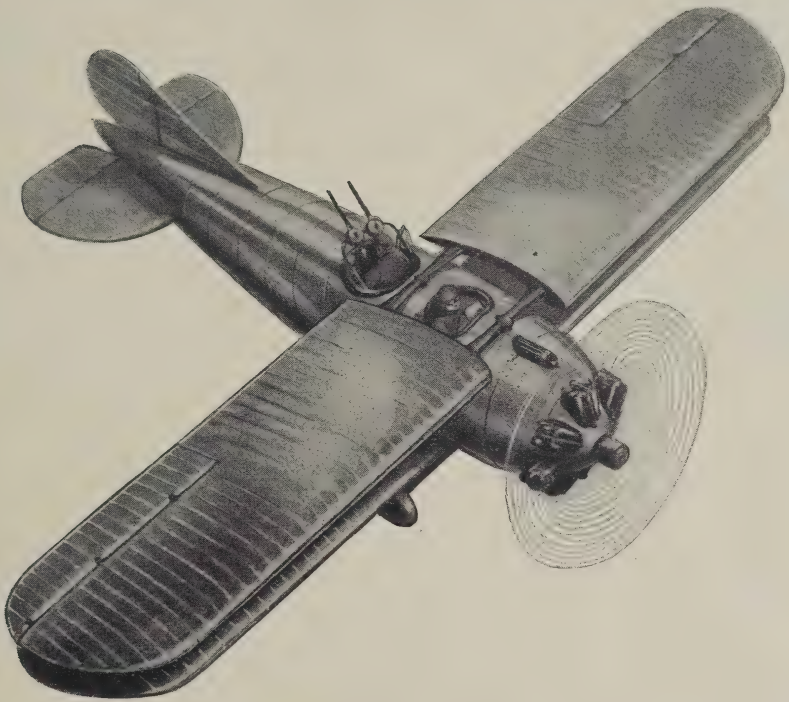
CLOETE.—On May 23, at 129, Wigmore Street, W., to Marjorie, wife of Flt. Lt. D. Cloete, M.C.—a daughter (stillborn).

SMITH.—On May 29, to Winifred, the wife of Wing Commander Sidney Smith, D.S.O., A.F.C., Ashdene, East Gate Salford—a daughter.

ALL-METAL

AEROPLANES AND SEAPLANES.

*Designers and Constructors of All-Metal
Aircraft for the British Government.*



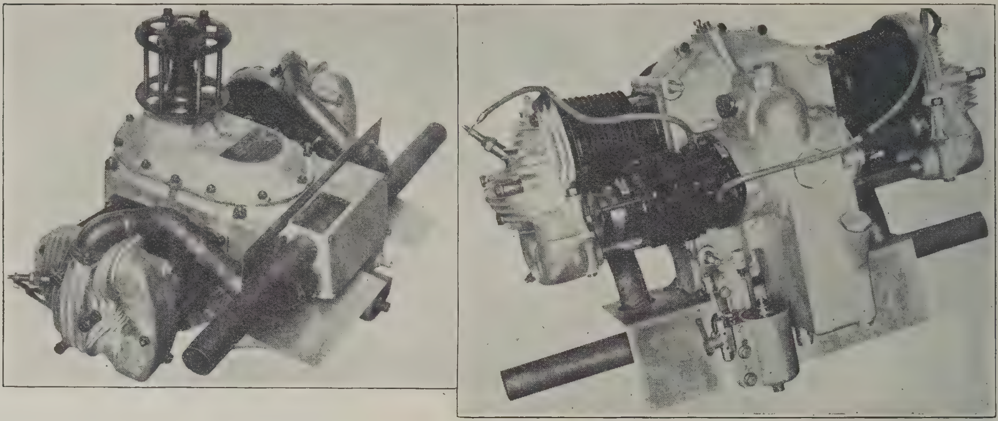
As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

SHORT BROS.

(ROCHESTER & BEDFORD) LTD,

WHITEHALL HOUSE, 29-30, CHARING CROSS, LONDON, S.W.1.

THE NEW BRISTOL CHERUB.



The Bristol Cherub (22-34 h.p.) in two positions. (The curious attitudes are caused by the viewpoint adopted by the photographer.)

Since the production of the original Bristol Cherub engine a number of examples of the type have been subjected to tests of one kind or another—among them being the running of one of these engines in the 1923 Brooklands light-car race, when three hours' run at full throttle and 3,700 r.p.m. was accomplished. Also as is well known a Cherub successfully passed the Air Ministry type test incidentally making a 50-hour non-stop run at 90 per cent. of full power.

As a result of the satisfactory performance of the experimental engines, the Cherub Series I has now been put into production and this type of engine will pretty certainly form the power plant of a large proportion of the competitors in this year's Air Ministry Competition for light aeroplanes.

The standard Cherub is of the direct-drive type, but a model with a geared-down airscrew drive is also manufactured.

The Cherub is of the well-known and highly satisfactory two-cylinder opposed type, and has a total cylinder capacity of just under 1,100 c.c.

The crankcase is an aluminium casting split vertically on the engine centre line and fitted with a separate front cover. This cover carries the deep-groove bearing which serves to take thrust on the crankshaft, and encloses the camshaft gears.

The crankshaft is a case-hardening alloy steel stamping, of ample dimensions, carried in four ball-bearings, the front one the deep-groove thrust bearing already mentioned. Behind this a smaller race carried in the front half of the crankcase serves as a steady for the timing gears. The rear end of the crankshaft carries skew gears for the magneto drive, and is again supported by two ball-races.

Connecting rods are alloy steel forgings with case-hardened big ends of a diameter large enough to be threaded over the crankshaft. When in position large-diameter rollers are fitted between big end and crank-pin. The big-end bearing assembly is amply proportioned to ensure a long life. The gudgeon pins float in both connecting-rod little ends and in the pistons.

The pistons are of aluminium alloy, fitted with two rings, the inner one of which serves as a scraper and returns surplus oil from the cylinder walls through drain holes in the piston skirt. The gudgeon pin is located in the piston by spring clips.

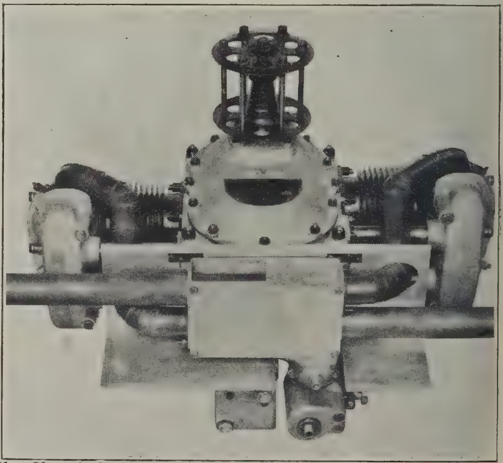
The cylinders have steel barrels fitted with detachable aluminium alloy heads carrying the valve seats and passages. The barrels are secured to the crankcase by a spigoted and flanged joint, a Dermatine ring serving to make the joint oil-tight. The cylinder head is bolted to a flange on the barrel and is also provided with a spigoted joint. As the coefficients of expansion of steel and of aluminium alloy are considerably different, there is a difficulty in maintaining uniform gas-tightness with a head of this type bolted on by steel bolts. To overcome this difficulty packing pieces of a special alloy are fitted between the cylinder head and the nut on the securing bolt, so proportioned that the combined expansion of bolt and packing pieces is the same as that of the aluminium head. The two valve seats are cast into the head, and sparking-plug bosses are fitted centrally in the head.

Inlet and exhaust valves are of cobalt-chrome steel, and are interchangable, and two concentric springs are used on each valve. The valve-operating gear is somewhat unusual and has distinctive features of considerable importance.

The camshaft which with its four cams is machined from the solid, runs across the crankcase below the crankshaft. It is driven by plain spur gears of ample dimensions and from its rear end drives the oil pump. The cams are of the constant-acceleration type. The valves are operated by rocker shafts which run parallel to the cylinder axes from crankcase to cylinder head. These may be regarded as the precise equivalent of the normal type of rocker arm which is interposed between camshaft and valve in the overhead camshaft type of engine, with the single difference that the rocker which is operated, through a finger, by the cams, is separated from that which operates the valves by a length of shafting. As the valve stems project from the cylinder heads radially relative to the cylinder bore, any difference between the expansion of the cylinder and that of the rocker shaft merely moves the valve stem slightly across the face of the operating rocker, but does not alter the valve clearance. A torsion spring fitted to the rocker shaft keeps the cams, finger, and operated rocker in contact and the whole valve gear is entirely enclosed.

The crankcase casting contains at the rear end a deep oil well in which is a drowned oscillating plunger pump driven by an eccentric on the camshaft. Oil is drawn into the pump through a gauze filter which entirely surrounds the pump proper and is delivered through a spring-loaded bye-pass valve which maintains a steady delivery pressure of approximately 5 lbs./sq. in. The oil then passes through a pipe inside the crankcase to a three-way boss at the top of the crankcase. One way in this boss has an external union for the connection of an oil-pressure gauge.

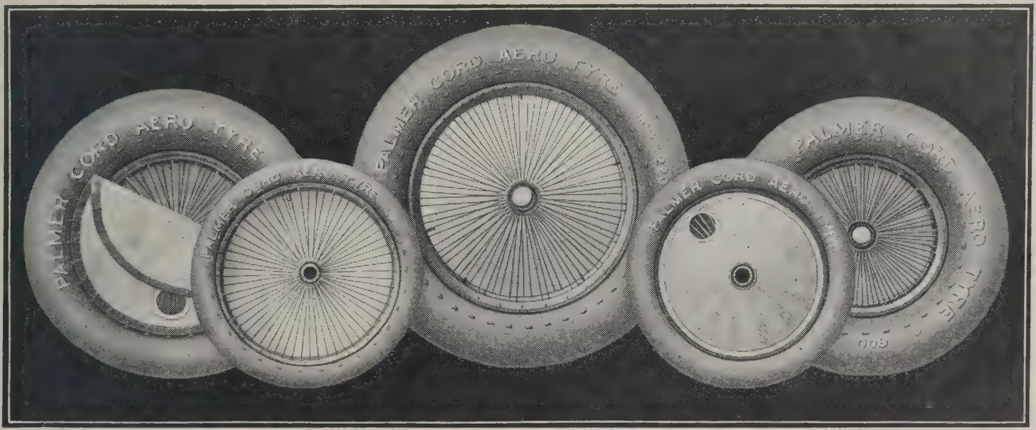
Of the other two ways one leads through a passage in the crankcase to leak-holes discharging over the crank-



The Cherub Series I viewed from below the crankcase, showing the air-heater box.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	161*	185.	55.	135/50
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	150	185.	55.	Central
,,	167	185.	55.	125/60
,,	174	250.	80.	Central
1000×150	201	185.	60.32	125/60
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55,	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 161, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.*
†Wheel No. 169 is fitted with Ball Bearings.

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S/NK (240)

shaft and the other through another passage discharges through a leak hole at the back of the case onto the magneto gears. The supply to the latter hole is controlled by a spring-loaded valve so that the crankshaft supply shall not be unduly depleted. The camshaft bearings are lubricated by a drain hole from the upper part of the crankcase.

As already mentioned the magneto is driven by skew gears at the back of the crankshaft. The magneto is carried by a flange and spigot mounting at the side of the crankshaft, the magneto lying behind and parallel to a cylinder with the contact breaker readily accessible. An impulse coupling is used in the magneto drive to render starting easy.

The carburettor fitted is a special type of Zenith with a hand-operated altitude control of the extra-diffuser type. The mixture passes from carburettor to induction pipes through cored passages in the crankcase, and the air intake to carburettor passes through a shallow box supported below the crankcase through which are passed the exhaust pipes which are arranged to cross from side to side of the engine. A drain for any excess petrol is fitted to the intake, and the whole of the air-heating system is screened from the engine.

The engine is mounted from screwed extensions on the ends of the four crankcase bolts at each corner of the crankcase.

A screw-down oil filler is fitted at the rear of the crankcase for filling the oil well and a standard connection for an R.P.M. indicator is arranged on the port side above the magneto.

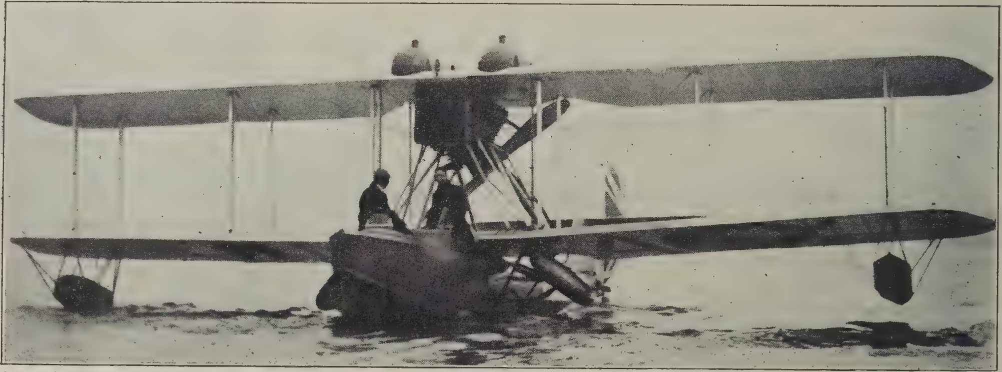
The geared model of the Cherub is in general similar to the standard model, but is slightly deeper from back to front. The reduction gear is housed in the crankcase front cover which is stiffened to carry the gears and aircraft shaft. This is on the same axis as the camshaft—below and parallel to the crankshaft and is carried in deep-groove ball bearings. The gear is of the plain spur type. The crankshaft gear is attached to a fly-wheel concentric with the crankshaft and driven from the crankshaft through a spring drive which damps out torque variations of the crankshaft and so relieves the gears of the serious stresses to which a rigid drive would subject them.

The camshaft front end is carried in and driven from the airscrew shaft, the reduction gear being of a 2/1 ratio.

SPECIFICATION.

Bore ……	3.35 in. (85 m/m.)	Weight (direct drive)	81 lbs. (37 kg.)
Stroke …	3.80 in. (96.5 m/m.)	Weight (gear drive)	105 lbs. (48 kg.)
Piston displacement	66.8 cub. in. (1,095 c.c.)	Fuel consumption (22 b.h.p.)	1.4 galls (6.4 litre) per hour.
Compression ratio …	5.5/1	Oil consumption (22 b.h.p.)	½ pint (.28 litres) per hour.
Normal output	22 B.H.P. at 2,500 h.p.m.		
Maximum output	34 B.H.P. at 4,000 r.p.m.		

A NEW SUPERMARINE.



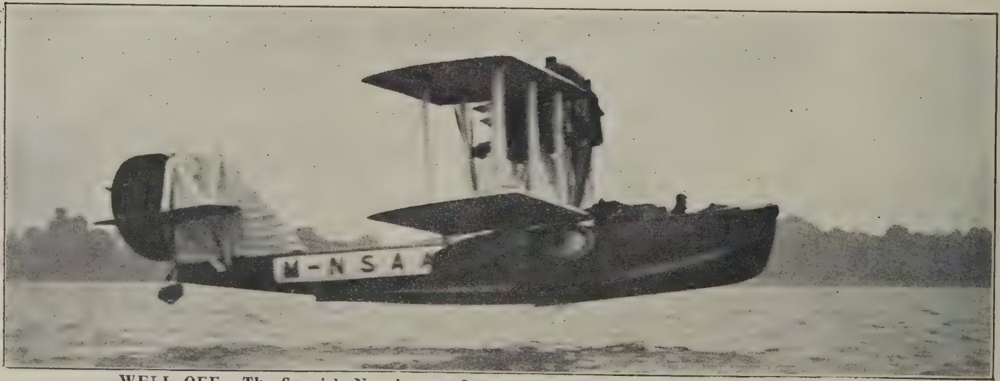
AFLOAT.—The new Supermarine Bomber for the Spanish Navy (360 h.p. Rolls-Royce Eagle IX). A boat with wheels.

The photographs here reproduced show a new Amphibian Bomber built by the Supermarine Aviation Works Ltd., for the Spanish Government. The machine is fitted with a Rolls-Royce Eagle engine. The machine was flown for the first time on May 27 and completed tests and was taken over by the representatives of the Spanish Government on the same day.

The flights made on that occasion consisted of a preliminary test flight with full load, after which the machine returned to the works. It then left for Worthy Down aerodrome near Winchester where a landing was successfully made in the presence of a number of Air Force officers and of Spanish officials, and of Flg. Off. Paul Smith who was present on behalf of the Airworthiness Department of the Air Ministry. After checking weights Flg. Off. Smith went aboard and the machine flew to Southampton where he took the machine up himself for trial.

With Spanish officers aboard Capt. Biard then took the machine and made test alightings in rough water off the Needles and then took her for a ceiling climb. The machine was then put through speed trials and was at once taken over by the Spanish Authorities.

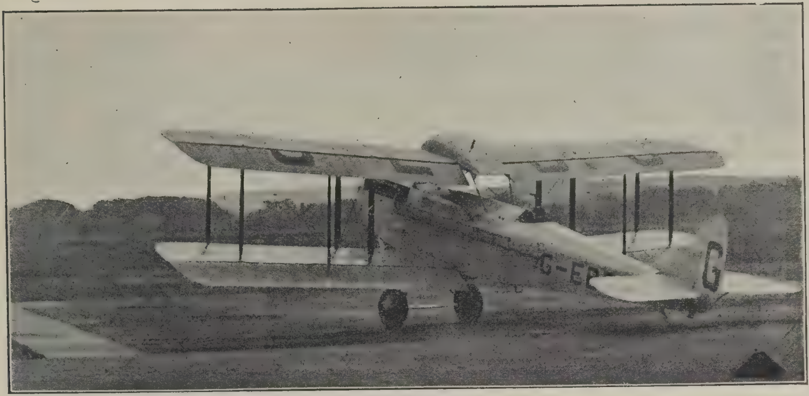
This machine is the first of its type and it is a high tribute to the designer, Mr. Mitchell, and to the work of the Supermarine firm that absolutely no hitch occurred from the first entry to the water to the completion of tests and that it should have been possible to complete the whole of the trials in so short a time.



WELL OFF.—The Spanish Navy's new Supermarine during trials on Southampton Water.

The D.H. Type 50 *flies to* PRAGUE

IN SIX AND A HALF HOURS



The D H. Type 50 Aeroplane, carrying distinguished British visitors to the Prague Aero Exhibition leaving Croydon Aerodrome.

¶ A D.H. TYPE 50 AEROPLANE (230 h.p. Siddeley "Puma" Engine), fitted with the D.H. Automatic Camber gear, carrying Lord Thomson, Secretary of State for Air, Mr. Frank Hodges, Civil Lord of the Admiralty and Major Gen. Sir W. Sefton Brancker, K.C.B., Controller of Civil Aviation, flew from London to Prague (690 miles) on May 30th for the opening of the International Air Exhibition, in six and a half hours' actual flying time.

¶ On the same day Mr. A. S. Butler, flying his own D.H. TYPE 37 AEROPLANE (270 h.p. Rolls-Royce "Falcon" Engine), accomplished the same journey in five and a half hours.

¶ Both these machines and other De Havillands will be available for demonstration during the Exhibition.

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Lubrication for Aircraft.

When lubrication is mentioned in connection with aircraft one almost inevitably thinks at once of engine lubrication alone. In the case of motor-cars most people realise that in addition to the engine such things as the gear box and the back axle require occasional supplies of oil and grease, and some fairly large number will remember occasionally that a little lubricant does no harm to such members as shackle pins, steering gear and the like. Actually if the utmost freedom from breakdown and the longest possible life are expected from a car adequate lubrication of all moving parts is as necessary as is engine lubrication, and the chassis lubrication can only be regarded as of less importance because it so happens that neglect thereof produces serious results only after a much more lengthy period than in the case of the engine.

The greatest incentive to the neglect of chassis lubrication in cars of the past has been the messy nature of the processes required and the knowledge that in many cases the lubricating arrangements provided were of singularly little effect. Of recent years the chassis lubricating system fitted to the majority of cars has been very greatly improved, both as to the efficiency and as to the ease with which lubricant may be applied.

In the case of the aeroplane there are also other parts of the apparatus beside the engine which are likely to function more satisfactorily and to live longer if they are properly lubricated. Landing-wheel hubs are an obvious example—yet it is even now not uncommon to find that the only method provided for greasing such parts is that of jacking up the machine, taking off the wheel and applying grease by hand.

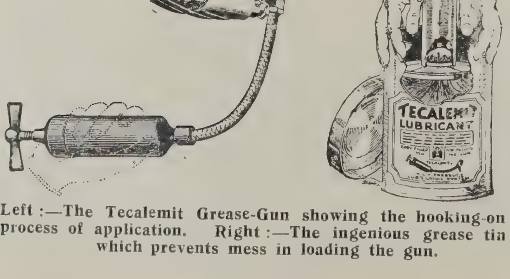
As aeroplanes become larger and more complex the number of parts other than the engine which require lubrication tends to increase. A large number of modern undercarriages embody telescopic shock-absorbing legs which need the application of oil or grease. Tail-plane operating gears, tail-skid pivot bearings, are better lubricated than not, and among the immense variety of auxiliary apparatus which form part of the equipment of the modern aeroplane there must be many which it would pay to lubricate properly.

Up to the present in the majority of cases such parts have been left to their fate in this matter and have been provided with no more lubricating devices than those of the landing wheels mentioned above. In some cases of modern machines the more important of the moving parts have been fitted with grease cups of the Stauffer type such as were until quite recently standard for the lubrication of motor-car chassis parts. Most people are well acquainted with the messy business of filling up a number of small grease cups and the still more messy one of unscrewing and screwing them up by hand. Also unless one can apply a spanner to the grease-cup head it is usually impossible to force grease through a channel clogged by dirt or hardened grease, or even to force it between two heavily loaded bearing surfaces.

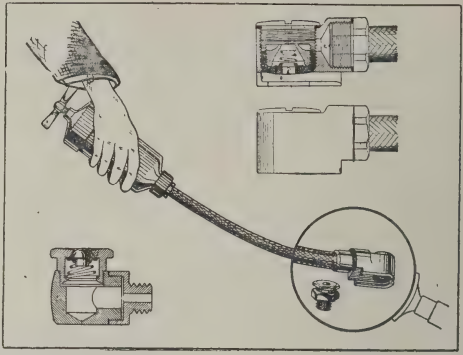
Most up-to-date motor-car manufacturers have now abandoned the grease cup in favour of the much more effective and less troublesome Grease-Gun method of lubrication, and there seems good reason why the aircraft constructors should profit by their past experience and adopt the modern system in the first place. As a matter of fact one or two aircraft constructors have adopted the Tecalemit Grease-Gun system for such purposes with very satisfactory results.

In the Tecalemit system the individual grease cup at each lubricating point is replaced by a " grease plug " which is simply a spring-loaded non-return ball valve and this occupies appreciably less space than the usual grease cup because it does not include any store of grease.

Grease is forced through these non-return valves by a " grease-gun " which is simply a plunger pump operated by a screw-thread instead of by direct pressure. The gun is a portable appliance which contains quite a large supply of grease and which can be used on each of any number of grease plugs. Instead of the fiddly little cap of the old grease cup the grease gun has a handle of ample size to which the screwing torque is applied, and a grease pressure of up to 1,000 lbs. per sq. in. can it is claimed easily be applied to the grease. Except under the most abnormal conditions this is adequate to clear blocked lubricating passages and to force the grease between loaded bearing surfaces.



Left :—The Tecalemit Grease-Gun showing the hooking-on process of application. Right :—The ingenious grease tin which prevents mess in loading the gun.



The Tecalemit System :—In the bottom left corner a grease cap with its ball valve. Top right the slip-on gun-nozzle. The sketch also shows the application of the nozzle to the grease cap.

The pump barrel of the gun is fitted with a flexible tube connection usually about one foot long though obviously longer tubes could be supplied if necessary. This tube terminates in a very simple coupling which has only to be slipped onto the head of the grease cup in order to make a tight joint with them. The handle of the gun is then turned once or twice and the coupling slipped off. The flexible tube is itself sufficiently stiff and the fitting on of the coupling so simple that the coupling-up operation can be effected without touching anything but the gun itself.

The grease-caps have a flat upper face and a groove turned in the body a little below that face. The coupling—or gun nozzle—on the end of the flexible tube is a hollow brass block, slotted and undercut on a face parallel to the axis of the flexible tube so that it can be slipped over the grease cap, the undercut edges of the slot engaging in the groove in the cap. Inside the body of the nozzle is a spring-loaded non-return valve which cuts off any accidental leakage of grease when the gun is not in use. The valve spring is supported at its outer end on a metal disk which in turn rests on a cup leather which comes into contact with the grease-cap face when the gun and the cap are coupled up. The cup-leather is pierced for the flow of grease to the cap, and the internal pressure on the leather suffices to force it into contact with the cap and to make a grease-tight joint.

The only possible messy part of the business of greasing by this system is that of filling the gun. Even this is overcome by the ingenious Tecalemit grease tin which enables the gun to be filled without touching the grease with the hands. Even if the special tin is not available one filling of the gun takes the place of a large number of fillings of the old type grease cup.

Tecalemit grease caps are made in such a form that they can be used in any place where a grease cup could be used, and in a good many where if the grease cup were fitted it could not be reached. All such caps fit the same coupling nozzle, and grease guns of various capacities suitable for either station use or for carriage on the machine are made.

Tecalemit fittings are supplied in this country by Tecalemit Ltd., of 11, Little Portland Street, London, W.1, and all those who are faced with the problem of providing satisfactory lubrication for parts such as have heretofore been inadequately lubricated by grease-cups should certainly investigate their system.

The Wreck of the Kingston.

On Thursday last the English Electric Company's new flying boat Kingston was wrecked on its first trials at Lytham. Major H. G. Brackley with one mechanic and a member of the Preston Works staff was taxying the machine on the water when he hit some floating object which tore the bottom out of the hull. The boat sank but the pilot and crew were unhurt.

The Kingston is a modified P5 driven by two Napier Lion engines. It is a five-seater intended for reconnaissance at sea.

As is usual in such affairs the boat was badly damaged in salving operations.

1919——1924

THE illustration above shows the first All-Metal Aeroplane exhibited by Boulton & Paul Ltd., at the Paris Exhibition in 1919, and demonstrates that five years ago the broad outline of the Boulton & Paul system of metal construction had taken form. Since that time, Boulton & Paul Ltd. have been continuously engaged in the design and construction of Metal Aeroplanes on an extensive scale. Their unique experience ensures proved reliable Aeroplanes.

THIS advertisement is the first of an interesting series of announcements dealing with the design and construction of Boulton & Paul Aeroplanes, to appear at regular intervals in this journal.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 14: Tuesday, 11; Wednesday, 12; Thursday, 8; Friday, 15; Saturday, 12; Sunday, 10.

London—Paris and London—Cologne :
Imperial Airways, Ltd, machines 36, passengers 179, freight —.
Paris—London :
Air Union, machines 32, passengers 113, freight 16,729 lbs.
London—Rotterdam :
K.L.M., machines 11, passengers 24.
Special Machines :
De Havilland Hire, machines 3, passengers 5.

Total number of trips by British machines: 39, carrying 184 pas. Foreign machines, 43, carrying 137 passengers.

Comparative Figures :
For week ending June 1 :
Machines, 82; Passengers, 321; Crews, 130; Total Personnel, 451.
Corresponding week, 1923 :
Machines, 103; Passengers, 285; Crews, 168; Total personnel, 453.
Corresponding week, 1922 :
Machines, 150; Passengers, 339; Crews, 207; Total personnel, 546.
Corresponding week, 1921 :
Machines, 85; Passengers, 339; Crews, 101; Total personnel, 440.
Corresponding week, 1920 :
Machines, 89; Passengers, 126; Crews, 100; Total personnel 226.

Croydon Notes.

The passenger traffic is increasing in a satisfactory manner. Over 300 people travelled on the air routes last week.

Another D.H.34 came to an end last week. Mr. Robinson was taking off from Ostend aerodrome on G-EBBR on Thursday when he hit a war memorial and crashed. The machine caught fire and was totally destroyed. Fortunately Mr. Robinson escaped with a few bruises.

It is believed that Imperial Airways Ltd. may acquire some D.H.50 flap machines, that is to say 50s fitted with the D.H. flap gear and not 50s which flap their wings. Such machines would be ideal for running frequent services.

There has been quite an influx and exflux of the high and mighty to the aerodrome this week. Lord Thomson, Mr. and Mrs. Stephen Walsh, Mr. Frank Hodges and Sir Sefton Brancker all left Croydon in the early hours of Friday.

Mr. and Mrs. Walsh left in a D.H.34 piloted by Mr. O. P. Jones at 06.28 hrs. and arrived at Cologne at 09.10. They returned on Sunday having left Cologne at 15.34 hrs. and arrived at Croydon 20.11 hrs.

Lord Thomson, Mr. Hodges and Sir Sefton Brancker left with Mr. Broad on the flap 50 at 07.36 on Friday and arrived back minus Mr. Hodges on Sunday at about the same time as Mr. Walsh arrived

For the Aircraft Disposal Co., Ltd., Mr. Perry made nine test flights on various D.H.9s during the week which are being prepared for various corners of the Globe.

His many friends will be pleased to hear Mr. Chattaway obtained a new son last week. Mr. Chattaway is now C.A.T.O at the Alexandra Park Aerodrome, Manchester.

The Cologne Air Mail.

The Postmaster-General announces that in consequence of the accident at Ostend on May 29 to the aeroplane by which it was conveyed, the Air Mail for Cologne of that date was destroyed.

The Lancashire Aero Club.

The Lancashire Aero Club is now in full swing at Alexandra Park Aerodrome, Manchester. Members of the Club have built two gliders, one of which is being fitted with a small engine, and flying with the gliders takes place whenever the weather allows. It is hoped to start the construction of further machines, including the building of a two-seat light aeroplane at an early date.

The Club have rented a shed from the Air Ministry and are now affiliated with the Royal Aero Club.

The Club is *not* a social one, the sole purpose being the construction and flying of gliders and light aeroplanes. Among the members are seven pilots, several riggers, fitters, ground engineers, etc., and it is under their direction that the unskilled members have assisted in building the machines.

Usually members meet in full strength on Wednesday evenings and Saturdays, and as a way of providing those interested with experience of construction and flying the Club is proving a big success. The staff of A. V. Roe and Co., Ltd., Newton Heath Works, have given great help, and the first two machines are of first-class workmanship.

The Week's Grindelling.

An output of nonsense exceeding all expectation has been written and spoken about Mr. Grindell Matthews and his so-called "Death Ray." Mr. Matthews gave a demonstration to officials of the Air Ministry last week during which with his little ray he stopped a petrol motor of his own but declined to stop one belonging to the Air Ministry. From a distance of 15 yards, again using his little ray, he lit an Osglim lamp. One is credibly informed that from a distance of 15 miles it is possible to light a similar lamp with the equally noxious rays sent out daily and nightly from 2LO the London station of the British Broadcasting Company.

Questions were asked about the ray in the House of Commons and Mr. Leach successfully disposed of Mr. Matthews and turned on that gentleman what should prove an equally effective death ray of his own.

Finally Mr. Matthews flew off to Paris in a W.8b and a temper.

A statement issued by Mr. Matthews and printed in *The Times* of June 3 says :—

> "My previous experiences of dealing with former Governments have shaken my confidence in their methods."

One offers one's congratulations to the Governments concerned on having shaken this gentleman's confidence. Governments often come in for criticism but from this it is obvious that there is good in them.

The whole affair can be summed up in a parody on Mr. Lewis Carroll and one ventures to suggest that the following is in accuracy and intelligence the equal of much that has been written and spoken about and by Mr. Grindell Matthews and his death ray.

The Grindlemat.

'Twas brillig and the Grindlemat
 Did gyre and gimble with his ray,
All mimsy was the Dailymail
 And the Newstar did bray.

Beware the Grindlemat my son
 The rays that kill, the rays that hatch,
Absorbing Phospherine; and shun
 The frumious money snatch.

He took his lethal ray in hand,
 Longtime the Brancksome foe he sought
Then rested he by the Thomson tree
 And stood awhile in thought.

And as in uffish thought he stood
 The Grindlemat with ray of flame
Came whiffling through the tulgey wood
 And burbled as it came.

One two! One two! and through and through
 The Leachish blade went snicker-snack
He left it dead and with its head
 He went galumphing back.

"And hast thou snuffed the Grindlemat!
 Come to my arms my Leachish boy!
Oh frabjous day! Callooh! Callay!"
 He chortled in his joy.

'Twas brillig and the Grindlemat
 Did gyre and gimble in his zone.
All mimsy were the Paris firms
 And the Chantier did Rhône.

For Holidays.

The wife of an invalided officer in the R.A.F. residing at Felixstowe has several large rooms, in which she would be glad to accommodate paying guests. These rooms are vacant during June and may be available during July. Every comfort and consideration is promised and moderate charges. Anybody who is interested is invited to communicate with K. de M., c/o The Aeroplane.

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INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

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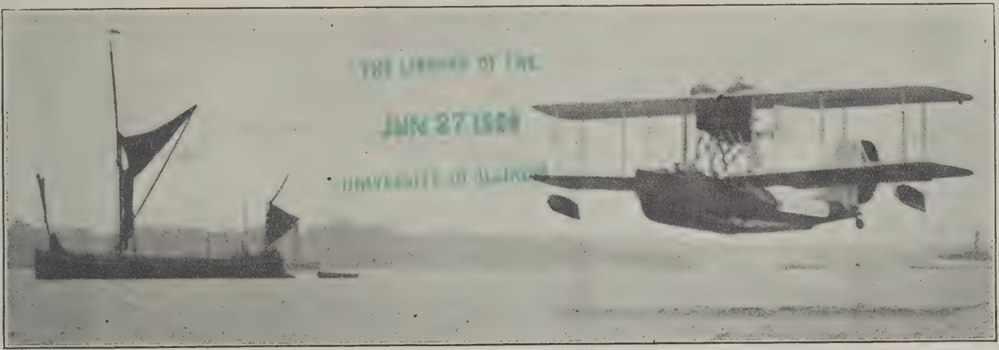

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FOR SEA, LAND AND AIR:—The first of a batch of light-bomber flying boats, fitted with Rolls-Royce Eagle IX engines and equipped with wheels for land work, built by the Supermarine Aviation Works Ltd. for the Spanish Navy, flying over Southampton Water.

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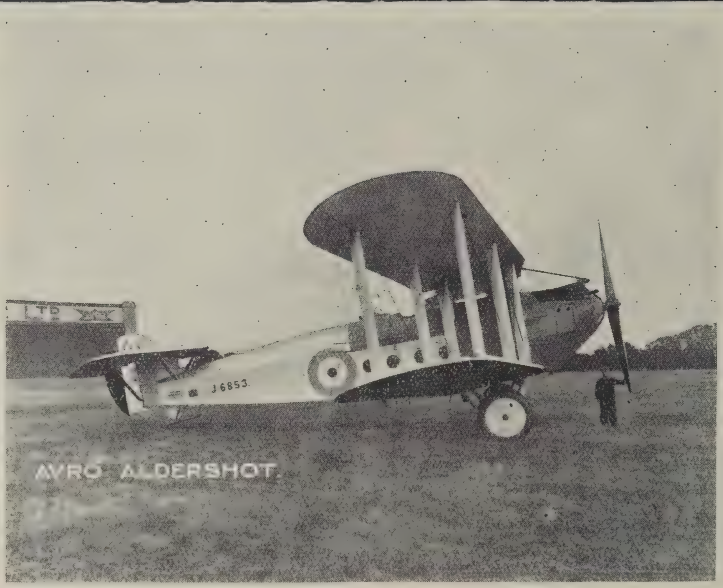

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AIRSHIPS IN THE HOUSE OF COMMONS.

On May 28 in the House of Commons in Committee of Supply, motion was made and question was proposed as follows :—

That a Supplementary sum not exceeding £350,000 be granted to His Majesty, to defray the Expense of Technical and Warlike Stores of the Air Force (including Experimental and Research Services) which will come in course of payment during the year ending on the 31st day of March 1925

The Under-Secretary of State for Air, Mr. Leach, explained that this sum was for the development of airships. His speech was commendably brief and explained the various points already explained in the House of Lords by Lord Thomson.

That a Labour Government can also be a business Government was neatly demonstrated when in reply to demands by Captain Brass and Mr. Wells and Lt.-Cdr. Kenworthy for information about where the overseas bases of the airship line were to be situated Mr. Leach explained that the reason why he did not think it wise to discuss the site of the intermediate bases was because we have not yet negotiated with the people who have to sell it. A mere refusal of the information on the grounds of policy would of course have been taken to mean that the location was to be obscured on military grounds and was just another of those secrets known to everybody but ourselves which are so common in Government affairs.

Mr. Leach also intimated that the period expected to elapse before the first ship would make its first voyage to India would be three years at the outside and he was pretty confident that it would be less.

Sir Samuel Hoare noted very remarkable progress in Mr. Leach and said that he came before the House that day not only as a full-blooded Imperialist but as a full-blooded militarist in that he was asking the House to agree to the building of a military airship by direct labour for the objects of the Air Ministry and the Admiralty. He himself (Sir Samuel) had never taken any such militarist view of the immediate development of airships.

Thereafter Sir Samuel drew comparisons, some odious and some otherwise, between the Conservative Government's scheme and the Labour Government's scheme. His chief objection to the latter was that it started at Cardington a new organisation for the direct construction of airships and that it set up in the Air Ministry a great new airship department although there were very few officials in the Air Ministry who knew anything about airships. He argued that the new department would dissipate energies which ought to be concentrated on the great problem of the home defence scheme.

Lieut.-Cdr. Kenworthy said that everybody ought to be grateful to Commander Burney for keeping the airship question alive. The past and present representatives of the Air Ministry in the House seemed to him like two horse dealers each trying to sell a horse to an unwilling purchaser. He said this because the state of the House (presumably empty as usual when air affairs are being discussed) showed how much interest Members really took in this great Imperial air roadway to our blood brothers across the sea. [One believes that the apparent indifference of Members to air affairs is due to the fact that they all agree that money spent on air defence is money well spent and consequently none of them take the trouble to go to the House to dispute the spending of the money. Politicians of all parties are agreed that the money ought to be spent. The only people who do attend air debates are those who have axes to grind, even if those axes in certain cases are only a praiseworthy desire to build up reputations as air experts.]

Continuing, Cdr. Kenworthy said that the present scheme seemed to be a little bit of private enterprise and a little bit of State Socialism and he believed that we were going to get the worst of both.

He pointed out that for naval purposes airships ought to use non-inflammable gas and he wanted to know what our possible supplies of helium were. Without helium an airship was extremely vulnerable and he would not send up any of our men in ships filled with inflammable gas in face of the rapid development of the naval air service.

He drew attention to the cost of airship sheds ultimately involved. He said that as we were going to have a naval war in the Pacific we should want a shed at Singapore as well as the Indian shed. If we were going to use airships over the Atlantic we should have to arrange with the Irish Free State for a shed in the West of Ireland. And all these would have to be revolving sheds.

He thought that all the money involved would be better spent in other aerial directions. The development of a commercial aeroplane service to Australia would be comparatively cheap and he was sorry to see that the Air Ministry was hampered by their agreement with the present heavier-than-air company (Imperial Airways Ltd.) which he was afraid would be rather a nuisance to us in the future. He said that he was perfectly certain that ultimately the heavier-than-air machine would oust the lighter-than-air machine.

Mr. Nichol said that the Government were embarking on an experimental business and that recent disasters had shown that compared with heavier-than-air machines airship development was at an almost infantile stage. He referred presumably sarcastically to "a commercial scheme" which was going to give a virtual monopoly to a group consisting of an "armament firm plus a petrol supply company aided by a group of aeronautical enthusiasts."

Sir Philip Sassoon reproached the Government with the contemptuous way in which it had dishonoured the commitments made by their predecessors in such matters as Imperial Preference and the accepted airship scheme. He said that if the Government wanted to demonstrate the superiority of Socialism over private enterprise in spending the greatest sum of money with the least possible result they could not hit upon a more convincing scheme than this for airships. He only hoped that in courting failure with this scheme we should not succeed in putting back airship construction indefinitely.

Rear-Admiral Sueter reviewed briefly the early history of naval airships and pointed out the valuable work done by the small non-rigid ships during the War. He said there was no case on record of any ship being sunk by an enemy submarine or of any lives being lost where these little ships were on patrol. He criticised adversely Commander Burney's scheme for using ships as the bases of mooring masts and said that proper sheds were needed even for minor repairs.

He congratulated Mr. Leach on the good case that he had put forward for airships and remarked :—"I think he has lost his New Testament, and I am not quite certain that the Secretary of State for War has not pinched it from him."

General Seely, in one of his usual excursions in technicalities, enunciated the interesting theory that the bigger you build an aeroplane the more difficult it becomes whereas the bigger the airship the easier the problem becomes. He also said that there was more reliability about an airship "than you could get in the case of aeroplanes."

Captain Brass admitted that he had not great faith in airships and would rather see the money spent on heavier-than-air machines. He also expressed scepticism as to the production of helium in large quantities and remarked that in any case it had not got the lift of hydrogen. In virtue of his own experience with balloons in the East he drew harrowing word pictures of the inconveniences of airships and said
he hoped that the money to be devoted to experiments
not be wasted.

Mr. Wells welcomed the re-opening of the airshi
in his constituency of Bedford and hoped that the
would be continuous.

Mr. Amery, lately First Lord of the Admiralt
airships because although the aeroplane was a
midable weapon of war the airship was a mor
vehicle for passenger transport. He remark
Members wanted to see something of the Briti
the short vacations of the House made it di
to do so. He said that if it were possibl

Africa in four days, the West Indies in three days, Canada in two days and Australia in ten days it would have an incalculable effect upon the whole sentiment of Imperial unity. [Perhaps one might ask in the Cockney vernacular "What's the matter with Wembley?"]

He said that commercial airships borrowed for naval purposes might be of the very greatest value. He made a good point in arguing that the subsidy paid to the Cunard Co. had induced them to run ships across the Atlantic at a speed which twenty-five years ago was not an economic speed and that since then any number of companies had run ships across the Atlantic at a much higher speed and had done good business in consequence. It was simply a question of giving a real start to commercial enterprise.

Also Mr. Amery said that there was something in favour of collective social ownership of things that had been well proved like gas and water—he even conceded railways—which were in the territory of the Government which undertook the ownership, but said that here we were dealing with something absolutely experimental where any amount of money might be wasted. [It is amazing to find Mr. Amery thus infected with socialistic ideas affecting industries which have proved themselves to be much more effective under private ownership than under State mismanagement. On the other hand if there is one way in which State money may be well spent it is in absolute experiments with new developments affecting the defence of the country or Imperial communication. In proof one may cite the fact that the Gas Light and Coke Company which is purely private enterprise and not even a limited company is about the best gas undertaking in the World, whereas municipal gas supplies are invariably bad and national gas, if it followed the lines of national telephones, would be an almost unthinkable calamity. Yet the Government might well improve matters by experimenting with a national scheme for broadcasting wireless entertainments, for there it could do no harm.]

Mr. Leach, replying to the debate, apparently as a convinced militarist, said that he felt in a contented and happy frame of mind. Having been reproached by Sir Samuel Hoare with cutting down the expenditure on airships and having been reproached by Lt.-Cdr. Kenworthy for spending far too much it seemed that the Government had hit something like the natural healthy medium.

Referring to Cardington he said that undoubtedly it would be employed permanently for building airships in the name of the Government and that so long as the need for military airships existed the Government were going to pay attention to that need. Under that scheme they were hoping to build twice as fast as was provided by the Burney scheme. They were actually working alongside the Admiralty for all ships that might be designed for naval purposes.

As to the passenger service to India the intention was first to offer it to the contractors who would build the first ship. If they were not willing or prepared to conduct this passenger service he dared say that the Government would feel compelled to conduct the service and they would make their preparations accordingly. He said:—

> I can see a picture of the Government of this country conducting with enormous success a mail, freight and passenger service to India for the great and lasting benefit and comfort, not only of the people of this country, but those of India as well

In reply to interpellations by Commander Kenworthy and Sir Samuel Hoare Mr. Leach said that Imperial Airways Ltd. had led him to believe that there were difficulties in the way of the Government conducting an aeroplane or seaplane service to India. As to Government construction he recalled that it was a practice which really started with Henry VIII, who began building ships which went on water at Portsmouth in the name of the Government. The present Government were merely continuing that practice.

A Suppplementary Supplement.

On June 4 the Debate on the Supplementary Estimate to provide airships was continued after 23.00 hrs.

Commander Bellairs moved an amendment to reduce the vote by £50,000, which motion if carried would amount to a vote of censure on the Government. His enmity had apparently been earned by the war-time Government which had urned down rigid airships during the War 1914-18 because, alleged, the German Zeppelins could always outnumber d ships. Also he appeared to dislike the Air Ministry pping the airships in 1922. Then he objected to the hip scheme because it would produce war airships ording to him, all the Admiralty wanted was plenty it airships, and he added:—"The beginning of ere, merchant ships in the old days."

it was as silly a speech as the House has heard me. Firstly, the airships which were turned the War were not of the rigid (or Zeppelin) the end of the War we were building rigid as fast as we could. Secondly airships never fought one another, so outnumbering had nothing to do with the policy of the Air Ministry. Thirdly, airships were scrapped in 1922 because we had not enough money for our much more important aeroplanes. Fourthly, Commander Bellairs ought to know that the British Navy was founded by the Roman pro-Consul who self-determined himself as Emperor of Britain, and was composed entirely of warships which cleared the seas for the use of the merchant ships which followed.]

Viscount Curzon seconded the amendment. He remarked on the steady advance of the Socialist Party towards militarism. Under the present nominally pacifist Government Civil Aviation had steadily declined till it was almost at a standstill and military aviation had made great strides. He was surprised that Members on the Socialist benches who had served in the Air Force like Mr. Mosley should remain silent. They had not heard from Mr. Mosley even a twitter.

Continuing, Lord Curzon said that before setting up bases in India and Iraq it would be better to test airships in co-operation with the Fleet, using monitors for mooring masts. He thought it a mistake to recondition old airships. He could not understand why the Government had turned down the Burney scheme. He did not like airships being classed under this estimate as "technical and warlike stores." He wanted to know whether the airships would be manned by naval ratings or R.A.F. airmen or both.

Rear-Admiral Sueter thought the Government's scheme very good indeed as it did not give a monopoly to one firm as did the Burney scheme. He did not believe over much in mooring masts: they would be all right at stopping places and for small repairs, but proper sheds were necessary for overhauls after a long voyage. As former chief of the Air Department at the Admiralty he said that the Navy had bungled the airship problem from start to finish. It was the Sea Lords who turned down the airship scheme during the War and he hoped all future developments would be left to the Air Ministry. He hoped that the airship which they proposed to recondition would only be used for mooring and aerodynamic experiments or for short flights, as its aluminium structure must have corroded and must have been stressed during storage without gasbags so that it would be dangerous to fly.

Mr. Maxton provided genuine comic relief by departing from airships altogether and turning a counter-ray on Mr. Grindell Mathews. He said:—

> I raise this point because it has come to my ears that within the last few days, in the research which the Air Ministry have been conducting with reference to the so-called "death ray" that was offered to them, there was engaged probably the highest expert in the service of the Air Ministry—presumably a valuable official on whose training much time and money had been expended, and one of the men, probably, who would be asked to be responsible for the work in connection with these airship experiments. I understand that among the tests as to whether this "death ray" could actually destroy men, ships, and so on, at a distance of several miles, as claimed by its inventor, was one that this expert of the Air Ministry was placed within 10 yards of this "death ray" and exposed to its action. My information does not go beyond that point, but I am disposed to think that, if the claims of the inventor were anywhere near being justified, this man must have been destroyed, and his body, perhaps, disposed of in some evil way—the Air Ministry has many resources at its disposal for such a crime—or, perhaps, he has suffered some severe injury. I want the Under-Secretary, first of all, to relieve my mind as to this expert, and also to give a guarantee that in the future this valuable staff of the Air Ministry will not be used in reckless experiments of this description.

The Under-Secretary of State for Air (Mr. Leach) said:—

> I think I ought to answer first the very important question addressed to me by the last speaker. It is true that the expert of the Air Ministry who examined the tests provided by the inventor of the so-called "death ray" seems to have been of a rather sceptical turn of mind, and that he actually placed himself in the path of the ray as part of the test to which he desired that it should be subjected; and it is also true that, as I am very glad indeed to be able to assure my hon. Friend, he is doing well, and when I last saw him, he displayed no evidence of any injury having occurred to him.

Continuing, Mr. Leach said that Lord Curzon in his "rather boisterous speech" has provided the last remaining excuse for the Air Ministry's scheme in that research to prevent accidents was the key-note of the scheme. He informed the House that the contract-built ship must have a speed of at least 70 miles per hour. They hoped for 85 or 90 m.p.h. from the Cardington (officially-built) ship. He said that though it would be a Service ship it would conform to many civil purposes. It would carry passengers goods and mails as well as being usable for troop-transport naval reconnaissance and aircraft-carrying. He expressed his gratitude to Admiral Sueter for his helpful criticism and for the precautionary measures he had advocated.

Thus the Supplementary Estimate was agreed, and one hopes that Cardington and the Aircraft Guarantee Company will forthwith proceed to get along with their jobs.

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Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Britanicos.

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéreos.

Diseñadores y constructores de hidroaviones, barcos, aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de aparatos especialmente adecuados para el levantamiento de cartas topográficas y fotográfias, hangares flotantes y completo equipo para estos mismos.

Diseñadores, por orden especial del Gobierno Británico del barco aéreo más grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suministrados en grandes cantidades al Gobierno Británico, durante la guerra y *después de su terminación.* En esta serie de paratos, el fuselage, el plano central y la unidad de la cola, son de tipo normal y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para los fines particulares a que se destina el aparato en cada caso. Todas las máquinas de este tipo, tienen alas plegadizas y están provistas del dispositivo patentado de combeo variable Fairey que da una alta capacidad y potencia de ascensión combinada con una velocidad baja de aterrizaje.

IRELAND AND AVIATION.

By C. G. GREY.

It is typical of Ireland that although one of the first aeroplanes to fly in the British Isles was built in Ireland—by Mr. Harry Ferguson assisted by Mr. (now Squadron Leader) Lywood, in 1910—and although Ireland produced some of our best pioneers and war pilots—such as Moore Brabazon, McCudden, Mannock, Harvey Kelly and Grattan Bellew—there should have been less flying in Ireland in proportion to the population and wealth of the country than in any other part of the Empire. Ireland had the first electric railway, at Portrush, and the first electrically lighted town, Carlow, and the biggest shipyard, Harland and Wolff's, and the biggest tobacco factory, Gallagher's, and a variety of other first or biggest ventures of their kind. But in all or nearly all of these activities the distressful country has failed to retain its lead.

Now Ireland has again taken the lead in that Belfast has acquired what is in effect the first municipal aerodrome in the British Empire. This aerodrome is the terminal station of the Liverpool-Belfast air route operated by a firm which is known officially as Northern Air Lines, whose activity is the first attempt to run a regular unsubsidised daily service within the British Isles. One hopes that the venture may meet with the success which the enterprise of its promoters deserves, and that it may bring them such financial reward as has attended Belfast's ventures in shipbuilding, linen-weaving, rope-making, tobacco-manufacturing and distilling.

The scheme for a Liverpool-Belfast line was introduced to Belfast, after the Plymouth-Manchester-Belfast scheme had failed to materialise, by Mr. D. M. Greig an Anglo-Scot who is well and favourably known in Civil Aviation through his connection with Air Transport and Travel Ltd., now defunct, and is perhaps better known to the Great British Public as a first-class player of lawn tennis. Associated with Mr. Greig in his scheme is Mr. E. Higgs, a Haileybury man, who is Mr. Greig's partner in International Lawn tennis matches.

The business arrangements in Belfast for Northern Air Lines are in the hands of Eason and Son Ltd. of 17, Donegall Place, who are (or were when one lived there) in Ireland just about what W. H. Smith and Sons Ltd. are in England. They have the biggest wholesale and retail business in reading matter of all sorts and run all or nearly all the railway bookstalls. So they are the best possible advertisers of air transport.

The Northern Air Lines Scheme.

The primary idea of Northern Air Lines is to accelerate the delivery of London newspapers in the North of Ireland. The papers leave London on the early morning newspaper trains and reach Liverpool before breakfast. Thence they are taken to the starting-place of the aeroplanes (of which more will be said later) which fly them up the English coast, across the Solway Firth and along the southern coast of Scotland to Port Patrick, in Wigtownshire. From this point the pilots make the shortest possible crossing of St. George's Channel to Donaghadee in the County Down, which is on a direct compass course from Port Patrick to the Belfast aerodrome.

Thus the papers reach Belfast long before lunch-time unless the machines are delayed by bad weather. And as these machines are De Havillands in the hands of such pilots as those employed by the De Havilland Co. the weather has to be very bad to stop them. By sheer hard luck there was a spell of thick fog at the very start of the service which prevented the machine from leaving Liverpool. But since then the work has been done with praiseworthy regularity.

The contract made by Northern Air Lines with the newspaper firms has assured a full load from Liverpool for an aeroplane a day for the period covered by the first agreement. Consequently there is no room for passengers to Belfast. But as there is no similarly guaranteed load on the return journey the machines carry either passengers or goods, whichever come first.

One Belfast business man whose business brings him to England every few days has bought a season ticket to Liverpool. He finds that an air trip of a couple of hours in the middle of the day, after he has done his morning's work in his Belfast office, is rather refreshing whereas the night journey by boat and train consumes energy. Others are already talking of following his example. And a fair amount of parcels traffic from Belfast to Liverpool is also assured. Therefore there is reasonable hope that there will soon be full loads in each direction

Mail-Carrying.

A very satisfactory bye-product of the service up to the present, which may well develop into the main work of the line, is the carrying of mails in each direction. By arrangement with the Postmaster-General letters by air mail are only surcharged one halfpenny and even this surcharge may soon be removed.

Belfast is continually in competition with Lille, in Flanders, for the trade in linen with America. Thanks to the Cherbourg-New York steamship service Lille has been getting letters from the States a day earlier than did Belfast and could post replies a day later. Now, thanks to Northern Air Lines, letters from the States which reach Liverpool at the same time as the Cherbourg letters get to Lille can be taken on to Belfast the same day, and letters from Belfast posted in the morning arrive in Liverpool in time for the usual evening post to London and Southampton and so are put on an equality with letters from Lille to Cherbourg. Also there is naturally a saving of a full day in letters from and to ships arriving at or starting from Liverpool.

The Belfast Aerodrome.

The aerodrome at Belfast is situated to the South and a little to the West of the City about opposite Balmoral between the Malone Road and the Lisburn Road—which is the main road to Dublin. Although it is within a few minutes' ride of the centre of Belfast by tramcar it is in very open country, especially towards the South and West whence the prevailing winds blow. Towards the North and East there is enough open ground to afford a safe landing in case an engine should fail when a machine is just leaving the aerodrome. Also there are no high buildings or trees to hamper the approach of a machine when landing from any direction.

The enthusiasm created in Belfast by the new line is remarkable, but quite understandable by anybody who knows the energy which the Belfast man puts into a job when once he is convinced that it is worth while. Personally one has always found him difficult to convince at the first introduction of a new idea but that when once he has made up his mind in its favour he can be left to run it by himself. And such is the efficiency of the hard-headed Northerner that he generally does it much better than anybody else could do it—as for example, apart from the commercial successes of Belfast, the formation of the Ulster Volunteers and their famous gun-running episode and the enlisting and equipping of the Ulster Division during the War 1914-18.

Though one has referred to the Belfast Aerodrome as a municipal affair it is not actually so, in that its initial losses cannot be charged to the City rates. But in effect it is a municipal venture because the money to buy the land and equip and operate the aerodrome has been found by prominent members of the Belfast Chamber of Commerce with the promised support of their colleagues and with the approval of the Municipal Authorities. In fact it is alleged that the Lord Mayor of Belfast has promised to fly, and may by now be flying for all one knows, from the roof of the City Hall a banner with the strange device " Use The Air Line," or words to that effect.

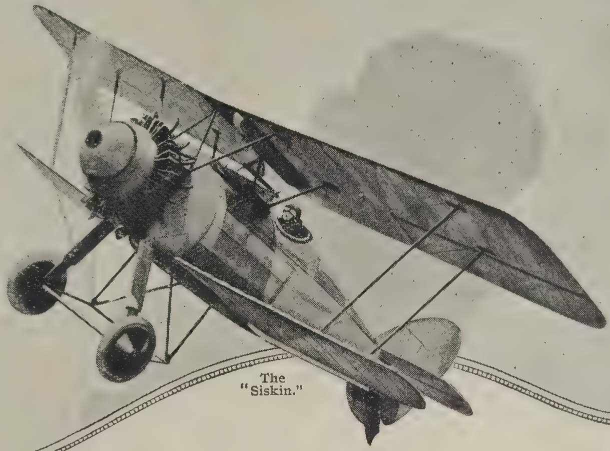
One is told that the syndicate of business men who are backing the aerodrome scheme have displayed that commercial acumen which is the cause of Belfast's greatness. The price which they have paid for the ground is said to be £10,000, and at the present rate of expansion of the city they stand to make a useful profit out of it as building sites within the next few years if Civil Aviation proves to be a failure. And if flying should prove to be as paying a proposition as all of us hope, then they will do well out of their investment in the way which they intended.

Either way they will deserve whatever they make, for at any rate they have shown more enterprise and more faith in aviation than has been shown by any English Chamber of Commerce in spite of all the talk there has been in some cities about founding a municipal aerodrome. While others have talked Belfast has done it.

Government Support.

The Government of the North of Ireland, or at any rate some of its officials, have given the airline that practical support which is so much better than sympathy. There is, somewhat naturally, no wireless station at the Belfast Aerodrome, firstly because the proprietors of the aerodrome have spent quite enough already on what is admittedly an experiment and secondly because transmitting messages by wireless is a Government monopoly, excepting always the British Broadcasting Company and the permission accorded to holders of experimental licences to broadcast bed-time stories during specified hours when normal people want to be in bed. Therefore, as it is essential that the Belfast aerodrome should have news of Liverpool weather (which is as bad as Manchester weather, only Liverpool will not own up to it), the Belfast police supply the necessary mechanism.

Every morning one of the Royal Irish Constabulary (North of Ireland Constabulary) with mobile wireless outfit on an automobile goes out to the aerodrome and gets in touch with the R.A.F. aerodrome at Shotwick. The R.A.F. station telephones to Aintree, where the aeroplanes live, and asks what the weather is doing there and then reports to Belfast whether



The "Siskin."

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Designers & Constructors of all Types of Aircraft

THE "Siskin" is of the single-seater fighting type, and is fitted with the Armstrong Siddeley "Jaguar" 14 cylinder air-cooled radial engine.

All the experience gained in the late war has been embodied in the "Siskin" which represents the most advanced design of this type of aeroplane that has been produced.

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ARMSTRONG WHITWORTH AIRCRAFT LIMITED

the machines will be able to start or not. And so the people at Belfast aerodrome know at once what their programme is to be.

A Ridiculous Argument.

The position in the matter of wireless communication seems to be a trifle complicated. Apparently some officials on other at the Air Ministry are disposed to argue that the use of Air Ministry wireless at Liverpool, or rather at Shotwick which is in Cheshire, is contrary to the Air Ministry's agreement with Imperial Airways Ltd. because that firm has a monopoly of the Government subsidy for Civil Aviation and therefore giving the service of Government wireless to the Belfast-Liverpool line is helping a rival concern. This seems to be the silliest argument imaginable. It is about equivalent to arguing that because the Admiralty subsidises certain steamship lines therefore Trinity House must not let the ships of any rival line look at its lighthouses at night or hear its bell-buoys in a fog.

Air Ministry wireless exists for the good of Civil Aviation and therefore its messages must be available for all air navigators. Croydon does not refuse to hear calls from such foreign aeroplanes as may carry wireless and it is bound to reply to those calls when they are understandable. Le Bourgêt and St. Inglevert have been known often to talk with the pilots of British aircraft. Ostende, Rotterdam and Brussels are quite chatty with our people. Therefore it is perfectly ridiculous to refuse to communicate with Belfast.

There is precious little use in our parsons praying for those in peril in the air Sunday after Sunday if our Air Ministry deliberately lays itself out to defeat them.

However, so far as one has been able to gather, Shotwick and the North of Ireland Constabulary between them do their best for the safety of the pilots and for the success of this sporting venture. And up to the present results have been satisfactory.

Liverpool's Backwardness.

As already indicated, the Belfast end of the line is well organised and receives enthusiastic local support. At Liverpool things are very different. The only available aerodrome is at Aintree, where the Aircraft Disposal Co. Ltd. have one of their big depots. The aerodrome is good enough, but it is too small for a fully-loaded D.H.50 to be sure of getting out of it under all conditions. Consequently the machines have to fly out of Aintree without their loads and land on the sands of the seashore at Southport, whither the newspapers have to be taken by car from the railway station at Liverpool, some twenty miles away.

The Liverpool Chamber of Commerce seems to take no interest in flying and cannot see that it would be to the advantage of Liverpool to have an aerodrome worthy of the size and importance of the city. If Liverpool had an aerodrome commensurate with the importance of Liverpool in the estimation of the ordinary Liverpudlian it would be the biggest in the World. Still, of course Liverpool is a maritime city and possibly its views on aviation are similar to those of other seafaring people—which is to say about ten years behind the times.

Belfast's Opportunities.

In spite of these hindrances Belfast will probably benefit very considerably by its air service. The arrival of the London newspapers during the morning of their publication is bound to be a great advantage to the Belfast business man and to the people in England with whom he does business and of the utmost value to the turf student.

The possibility of sending samples of linen and other light merchandise by air to Liverpool will also accelerate and will consequently increase business. For time is more than ever money in these days.

Consequently even if the backers and promoters of the Belfast aerodrome do not get their money back in the form of dividends in the near future they will at any rate have the satisfaction of knowing that Capital and Labour in Belfast are alike benefiting by their enterprise and that the profits on the increased trade of the city due to the accelerated communication with England amount to a good deal more than the price of the aerodrome and the possible loss on running the air line.

Mr. Greig's Liverpool-Belfast service will, one hopes, be at least as good as his service on the tennis-court, which is very good indeed. So far there have been few faults in the Belfast service and certainly no double faults. The machines travel to and from the opposite ends with the regularity of a good rally.

(To be continued.)

M. Sadi-Lecointe's Thirst for Speed.

After being the high instead of the quick record man of the World for some time, according to the French papers M. Sadi-Lecointe is again after the speed record which is at present 266 m.p.h. and was made in America.

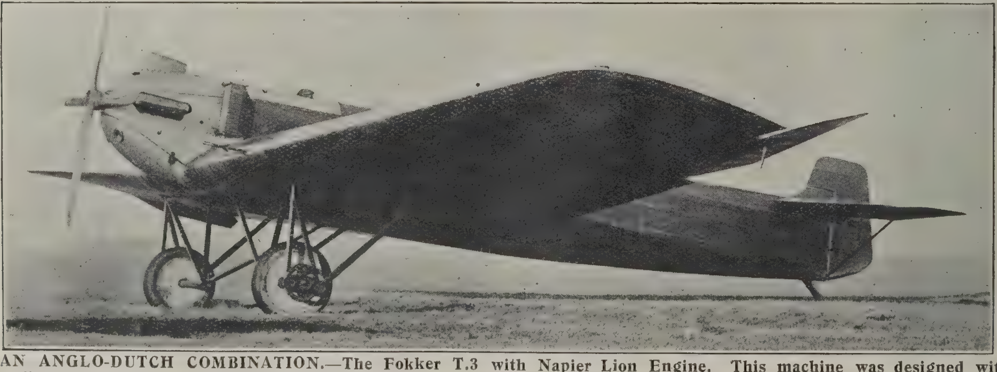
A new Nieuport-Delage monoplane has been built with a 600 h.p. Hispano-Suiza engine. It is now at Istres aerodrome and M. Sadi will from tomorrow, Thursday, until July 7, with an interval for the Beaumont Cup, make onslaughts on the speed record.

It is hoped on the best authority that M. Sadi and his machines will participate in the Aerial Derby. Apart from the meagre monetary prize attached, it is worth winning as it is the oldest established speed race for aircraft in the World.

Flying in Switzerland.

A friend in Switzerland writes to remind The Aeroplane that aviation in Switzerland is not entirely non-existent. He says that the air line Lyon-Genève-Lausanne was re-inaugurated at the beginning of June and ought to function regularly. Secondly he says that on May 29, the day of the Ascension, there took place on La Blécherette Aerodrome at Lausanne a "Grand International Aviation Meeting." All would have been well, he says, if M. Fronval "the Ace of the loopings" had not entered into the public (run into the crowd) instead of getting off; if one of the French aces of the War had not killed himself in chasing too low a ballonnet (toy balloon); if the Italian Cerutti had not just escaped doing the same while doing a vertical turn level with the ground when getting off; and if another Frenchman had not landed in the wreck of Cerutti's apparatus, happily without damaging himself much. It seems to have been an afternoon crowded with emotions.

The Swiss aviators Burkhardt and Ackermann were classed first and second in the acrobatic competition and Ackermann was second to Sadi-Lecointe in the speed race. A sensation was caused by the French aviator Thoret who flew a two-seater Hanriot with his airscrew stopped to the admiration of all—presumably gliding above a cliff. A new machine of the pursuit class built by M. Haefeli at the national factory at Thoune took part in the meeting. No figures are obtainable but its speed is more than 250 km. (150 miles) per hour.



AN ANGLO-DUTCH COMBINATION.—The Fokker T.3 with Napier Lion Engine. This machine was designed with a different engine for Captain Saccadura Cabral's proposed flight round the World. In its present form it is used as a torpedo carrier. It is possible that one may be used by Major Zanni for the Argentine Round-the-World attempt.

Napier achieves another World Record.

A Fokker C.IV. Aeroplane, fitted with a single 450 h.p. Napier aero engine, piloted by Mr. Otto Ballod, reached a height of 21,276 feet whilst carrying a load of 1,102½ lbs.

This has been certified as a World Record by the Federation Aeronautique Internationale.

The Napier engine holds
more World records than
any other British engine.

NAPIER

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Russian News from France.

The French journal *L'Aero Sports* has published certain information concerning the aeronautical activities of Soviet Russia of which the following is a fairly literal translation :—

There is another effort of which the importance grows daily, to the point of disturbing the slumbers of Mr. C. G. Grey the distinguished Russophobe of the English revue THE AEROPLANE. We wish to speak of the energetic impulsion given by the Soviets to the development of their aviation, an impulse, the practical result of which is translated to-day by a remarkable extension of an aerial organisation that did not exist two years ago.

This progress is due to a considerable extent to the clear and interesting counsels of the Teuton technicians, a progress that would of its intensity disturb us if, as is happily the case, the instability of its political regime would not compel Russia to be practically entirely ignored by the outside world.

[NOTE.—It is entirely the fault of French fear of Germany that the German technicians have been compelled to seek a living in Russia when they might have been developing Civil Aviation for the ultimate good of the World.—C. G. G.]

Be that as it may it is not perhaps out of the way to know to what occupations the Bolshevik constructors are devoting themselves. Actually six big firms divide between them orders from the State which they try to fulfil.

The DUX firm, of Moscow, which incidentally employs the services of 750 workers, turns out weekly four De Havilland aeroplanes per week. And that's all!!

The MOSKWA works, established also in Moscow, produces four aeroplanes every month, thanks to 350 workers!

The BOLSHEVIK works, ex-Gnôme Co., specialises in the *mise-au-point* of 180 and 220 h.p. Hispano-Suiza engines which they deliver at the rate of six per month. They are also studying, one believes, the possibilities of manufacturing Liberty engines.

On the other hand 600 male employees of the RUSSO-BATIGNY Co., of Petrograd, assemble 240 h.p. Renault engines.

Also the MOTEURS MOSCOVITES have reached, for the moment, a delivery of ten 110 h.p. Le Rhônes a month.

Finally the ANATRA Co., since its installation at Taganrog, with a personnel of 120 workers, has obtained a record with a delivery of 10 seaplanes per month.

Naturally it is necessary to add to this list companies of lesser importance such as the LEBEDEFF, SCHETININ, SLUZARENKO, etc., who mostly have their offices in Petrograd.

This table is sufficiently assuring in spite of the numerous purchases of material made by the Commandant Djevalkovski in Berlin for the Soviet Aerial Forces.

That which is less assuring, for example, is the silence concerning the organisation of vast factories of which Junkers have assumed direction. We have already mentioned these rumours, which the facts, notably certain short paragraphs that have appeared in the Soviet Press and an interview with the Director of the Aerodynamic Institute in Petrograd, seem unfortunately to confirm only too well.

FLYING IN BRITISH COLUMBIA.—This photograph was sent by a correspondent in Vancouver to illustrate the only Civil Aviation in that area (as distinct from the work of the Royal Canadian Air Force). One's only remark is that of the old lady from the country who visited the Zoo and on seeing a giraffe remarked to her husband :—John! I don't believe it!"

Developments in Australia.

On Jan. 14 the Broome-Geraldton service of the Western Australian Airways Ltd. was extended from Geraldton to Perth, thus making the total length of the service 1,355 miles. The inaugural flight left Broome on Jan. 14 and arrived at Perth the next day, a 12-hour stop being made at Onslow overnight.

The weekly mileage covered by the W.A.A. Ltd. in their aerial mail contract on the N.W. coast of Western Australia is now 2,900. The Commonwealth Government is preparing to extend the service from Derby to Wyndham via Halls Creek, involving an extra 1,500 miles flying per week.

The present service has been in operation for 2½ years and with the exception of a fatal crash during the very first flight the service has been carried on without accident. The number of letters carried during the first month the service was in operation was 577; and this has now increased to about 15,000 per month.

From May 12, 1921, to Jan. 31, 1924, 1,396 flights covering 248,081 miles in 3,151 flying hours have been made, carrying 945 passengers.

REMINISCENCES.

R.A.F. Triolets.

1. See the giddy fighting plane
Pirouetting round
Like a moth become insane,
Or a cat expecting rain.
If it loops the loop again
It will dent the ground.
See the giddy fighting plane
Pirouetting round.

2. Pretty little kite-balloon,
Clinging to the sky,
Like an elongated moon,
Or a chrysalis cocoon.
Surely Fritz will very soon
Close your prying eye.
Pretty little kite-balloon,
Clinging to the sky!

"Over Fire."

You know that funny feeling
When the shells were overhead
And filled your dug-out ceiling
With assorted bits of lead?

It was contrast you were needing,
With the shells all down below,
In an aeroplane that's speeding
At a thousand feet or so.

When "under fire" was trying,
And crumps began to tire,
You should have come up flying
And tried it "over fire."

To the W.R.A.F.S.

I like to see them dressed in brown,
All working with such vigour,
With sleeves turned up and eyes cast down,
But not the vestige of a frown,
Their simple but becoming gown
Well suits a comely figure.
I *like* to see them dressed in brown,
All working with such vigour!

I like to see them dressed in blue,
When they have finished working,
And having nothing else to do,
Go promenading, two by two,
With just a glance for me or you
Where we are shyly lurking!
I *like* to see them dressed in blue,
When they have finished working!

And girls who'd never worked for money,
Clean the grates and carry coke,
And yet contrive to keep so sunny,
Look on life as always funny,
Even after fat or honey,
Washing plates is *still* a joke.
Girls who'd never worked for money,
Smile beneath the menial yoke.

R. T. FREEMAN.

ROLLS-ROYCE

Aero Engines

THE BEST IN THE WORLD

Some extracts concerning the recent flight of 8,500 miles round Australia from "The Aeroplane" of May 22nd, 1924, entitled

"ON THE AUSTRALIAN TRIUMPH"

"A performance which may fairly be claimed as **the finest flight in the history of aviation.**"

"The durability and reliability shown by the Fairey seaplane and the Rolls-Royce engine . . . . . have **established once more the reputation of English aircraft** design and material in the esteem of the aeronautical authorities of foreign nations . . . . ."

RELIABILITY

Some Successful Flights made by Rolls-Royce Engines:

England to Australia	11,500 miles
England to S. Africa	6,281 miles
England to Sweden (and back)	2,450 miles
England to Constantinople	2,160 miles
Across the Atlantic	1,890 miles
England to Finland	1,100 miles
England to Warsaw	1,050 miles
England to Madrid	855 miles

These flights were accomplished without any change of engines en route

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THE ROYAL AIR FORCE.

The London Gazette.

June 3.

General Duties Branch.—G. H. Bennett is granted a S.S. commn. as a Flg. Off., with effect from, and with seny. of, May 23. The follg. Plt Offs. are promoted to the rank of Flg. Off. (June 2):—W. J. E. Rodwell, J. M. Darroch, and E. C. Roark.

Flg. Off. C. B. B. Maturin resigns his perm. commn. (June 4). The S.S. commn. of Plt. Off. on probation V. M. Callen is terminated on cessation of duty (June 1).

Medical Branch.—R. T. F. Grace, M.B., is granted a S.S. commn. as a Flg. Off. (May 19). F. S. S. Whiter (temp. Lt.), Dental Surg., General List Army), is granted a temp. commn. as a Flg. Off. on attach. to the R.A.F. (May 23). He will continue to receive emoluments from Army funds.

Appointments.

June 9.

General Duties Branch.—Flight Lieutenants D. K. Cameron, to R.A.F. Base, Leuchars, 26/5; W. G. Preston, D.F.C., to H.M.S. *Eagle*, 26/5.

Flying Officers H. R. B. Howell, to R.A.F. Base, Leuchars, 10/6; G McClintock, to R.A.F. Base, Leuchars, 4/6; A. C. Tremellen, to C.F.S., Upavon, 30/5.

Pilot Officers B. J. Finn, to No. 3 Sqdn., Upavon, 4/6.

Medical Branch.—Flying Officers (Medical) F. W. G. Smith, M.B., B.A., to R.A.F. Depot, 3/6; A. A. Townsend, M.B., to Research Laboratory and M.O.S. of I., for short course, 27/5.

Stores Branch.—Flight Lieutenant (Stores) N. Robertson, to No. 1 S.D., Kidbrooke, 6/6. Flying Officer (Stores) R. T. Rich, to No. 19 Sqdn., Duxford, 11/6. Flying Officer (Accountant) B. L. Blofield, to No. 29 Sqdn., Duxford, 16/6. Pilot Officer (Stores) R. G. A. Vallance, to No. 1 S.D., Kidbrooke, on appointment to a Perm. Commn., 19/5.

Awards.

The London Gazette of June 3 announces that His Majesty the King has approved of the award of the Air Force Cross to the following officers of the Royal Air Force :—

Flt. Lt. H. L. Macro, D.F.C., and Flg. Off. C. E. Horrex. Mr. Macro is a Flight Commander at the School of Naval Co-operation, Lee-on-Solent, and Mr. Horrex is stationed at the Aeroplane and Armament Experimental Establishment, Martlesham Heath.

The Swan Memorial Fund.

One would like to remind the many readers of this paper who owe their health, and in many cases their lives, to the work of the R.A.F. hospitals that a fund has been opened to found a memorial to the late Doctor Charles Atkin Swan who was in fact the founder of the first R.A.F. hospital during the War and so was the father of all such hospital work as distinctly pertains to the R.A.F. The object of the fund is to endow a Doctor Atkin Swan Cancer Bed at St. George's Hospital.

The sum required is £1,000 and a little over half of this sum has already been subscribed. Contributions however small will be gratefully received and should be sent direct to the "Atkin Swan Memorial Fund," Westminster Bank, 1, Cavendish Square, W.1. Cheques and Postal Orders should be crossed "Atkin Swan Memorial Fund."

The Royal Tournament.

The inter-Services Fencing Championships were decided at Olympia during the Royal Tournament.

Flt. Lt. Sherriff, R.A.F., won the Epée Championship on June 2 with no defeats. There were two representatives of the R.A.F. in the final pool, Flg. Off. F. C. Chalmers being beaten by all the other competitors.

In the Epée competition for Other Ranks of the R.A.F., Sjt. J. Digby was first, Cpl. A. E. West, second, and Cpl. D. G. Douglas third.

The Sabre competitions took place on June 3, with the following results :—*Officers*, R.A.F.—Flg. Off. Chalmers (1), Flg. Off. G. C. O'Donnell (2), Flt. Lt. Bentham (3). *Other ranks*.—Cpl. W. R. Hancock (1), Sjt. W. Scott (2), Sjt. J. Lancaster (3).

The Inter-Service Championship was won by Lt. C. A. Kershaw, R.N., who beat Flt. Lt. Sherriff in the final round by four hits to two.

On June 4 the Bayonet v. Bayonet championship competition was held, the R.A.F. teams being placed as follows :—*Officers*.—Group Capt. Warrington-Morris (1), Flt. Lt. F. E. Porter (2), Flg. Off. R. A. Vosper (3). *Other ranks*.—Flt. Sjt. W. G. Barber (1), Flt. Sjt. F. Watson (2), Sjt. J. Digby (3).

Flt. Lt. Sherriff won the R.A.F. Individual Championship.

The R.A.F. results in the Foil v. Foil competitions were :—*Officers*.—Flg. Off. Chalmers (1), Flg. Off. O'Donnell (2), Flt. Lt. Bentham (3). *Other ranks*.—Cpl. Hancock (1), Sjt. Scott (2), Sjt. Digby (3).

Flt. Lt. Sherriff has been selected by the Amateur Fencing Association to represent Great Britain at the Olympic Games in Paris in the Foil and Sabre teams and also in the Individual Foil and Sabre events.

In the finals of the R.A.F. Tug-of-War Championships (130 st.), R.A.F. Cranwell beat R.A.F. Manston by two pulls to nil and (110 st.) R.A.F. Gosport beat R.A.F. Manston by two pulls to nil.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Inland Area Aircraft Depot Sports.

The Annual Sports of the I.A.A.D. at Henlow on June 4 rather resembled a regatta, but the native pertinacity of the English Sportsman carried them through in spite of the weather. Grp. Capt. Ulick Bourke, O.C. Depot, was unfortunately away ill, but Wing Cdrs. Oliver and Blackburn presided in his stead, and at the finish the prizes were gracefully presented by Mrs. Ulick Bourke, who had come over from Norfolk specially for the purpose.

The performances were good and the organisation was excellent. The results of the events were as follows :—

100 *Yards*:—1, AC. Hails; 2, Cpl. Robinson; 3, AC. Lisle.

Putting the Shot:—1, Ray, E.R.S. (21 ft. 8 in.); 2, Green, E.R.S.; 3, Cpl. Plum.

Half-mile Flat:— 1, AC. Buxey, E.R.S.; 2, Liddle, E.R.S.; 3, Hopgood, E.R.S.

Pillow Fight:—1, Hart, E.R.S.; 2, AC Compton, A.R.S.

Tilting the Bucket:—1, Barrett—Compton; 2, Cpl. Hawkwood—AC. Hammond.

220 *Yards' Flat*: AC. Bloomfield; Cpl. Robinson; 3, AC. Lisle.

High Jump: 1, Peachy; 2, Clug; 3, Deadman.

1 *Mile Flat*: 1, Buxey; 2, Whitaker; 3, Parham.

Tug-of-War:— 1, E.R.S. B. Team; 2, E.R.S. A. Team

Inter-Section Relay:—E R.S.

Egg and Spoon Race:—1, Mrs. Glanville; 2, Mrs. Baldwin; 3, Mrs. Guille.

Boys' Race:—1, William Guthrie; 2, Cyril Pinnock; 3, V. Cheshard.

Long Jump:—1, Pridmore, E.R.S.; 2, Ray, E.R.S.; 3, Rosum.

Obstacle Race:—1, Cpl. Hawkwood, H Q.; 2, Barrett, A.R.S.; 3, Tate, E.R.S.

440 *Yards Flat*:—1, Hopgood, E.R.S.; 2, Lisle, E.R.S.; 3, Liddle, E.R.S.

220 *Yards W.O.'s and Sjts.*:—1, Sjt. Baldwin, A.R.S.; 2, Sjt. Murtagh, Stores; 3, Jarman, E.R.S

3 *Miles Flat*:—1, L-AC. Caverney, A.R.S.; 2, L-AC. Brown, E.R.S.;

Girls' 60 Yards Handicap:—1, Olive Fish; 2, May Weedon; 3, Eileen Read and Peggy Cafferty.

120 *Yards Hurdles*:—1, AC. Peachy; 2, Halls; 3, Pridmore.

1 *Mile Relay*:—1, Uxbridge; 2, Ruislip; 2, Henlow.

2 *Mile Walk*:—1, AC. Price, A.R.S.; 2, Cpl. Bruty, E.R.S.; 3, AC. Crossby.

Band Race:—1, AC. Turner; 2, AC. Smith; 3, AC. Wilkinson.

Consolation Race:—1, Cpl. Barnes; 2, Cpl. Brisden.

F/A. Inter-Section:—1, E.R.S. Hut; 2, H.Q.

Inter-Hut:—1, E.R.S. Hut 16; 2, H.Q. Hut, 11.

Challenge Cup:—E.R.S. (17.5 points).

Individual Cup:—AC. Peachy (18 points).

R.A.F. Shooting.

The R.A.F. Shotwick Rifle Club (affiliated to the National Rifle Association) held their annual prize meeting on Sealand Rifle Ranges on June 3 and 4. There were about 100 competitors and several spectators of both sexes.

A match was shot under United Service conditions between the R.A.F. Shotwick and the Cheshire Regt. resulting in a narrow win by the Army of 18 points.

Other events were :—(1) The R.A.F. Shotwick Championship (1924) for the Styran Challenge Cup, won by Flg. Off. Stringer. (2) The Donegal Bronze Badge, won by Flg. Off. Stringer, after a tie with Sjt. Jaggard. (3) The Marksman's Cup, won by Sjt.-Maj. Loughhead. (4) The Tyro Cup, won by L-AC. Vickers. (5) The Revolver Cup, won by Flg. Off. Riordan, A.F.C. (6) The Rapid Firing Cup, won by L-AC. Pearce.

Sjt. Hurrell of the Cheshire Regt. won the bronze medal for the highest score in the R.A.F. v. Cheshire match.

The Senior Officers' Cup was won by Sq. Ldr. Wynne-Eyton, D.S.O., whose squadron also won the Inter-Squadron Challenge Cup (the Summers Cup).

The Senior Officers' Bronze Medal was won by Sq. Ldr. McCrae, M.B.E.

The prizes were presented by Mrs. C. T. McClean, who was presented with a bouquet of choice flowers tied with the R.A.F. colours.

Amongst others present were Wing Comdr. C. T. McClean, D.S.O., M.C., commanding R.A.F., Shotwick, Sq. Ldr. and Mrs. McCrae, Sq. Ldr. and Mrs. Wynne-Eyton, Sq. Ldr. the Rev. Wormald, Chaplain to the R.A.F., Lt. Lourens of the Cheshire Regt. and Captain R. N. Lamb of the North London and Altcar Rifle Clubs and Liverpool and District County Association.

It was announced that the Honorary Secretary, Flg. Off. L. J Riordan, A.F.C., has been appointed Assistant Executive Secretary to the R.A.F. Rifle Association for the 1924 Bisley meeting.

Lawn Tennis.

R.A. v. Roehampton :—The R.A.F. played their first Lawn Tennis Match of the season against Roehampton on the grounds of the latter club, May 31. The match ended in favour of Roehampton by 6 matches to 3. Owing to the heavy rain the grass courts were very dead, but the match was a most enjoyable one and on the day's play Roehampton were decidedly the better side. The following represented the Royal Air Force :—

Flt. Lt. J. Duminy and Plt. Off. C. F. Roupell.

Sq. Ldr. V. E. Lindop and Sq. Ldr. F. G. H. Williams.

Flt. Lt. F. T. Boucher and Flg. Off. F. T. Boucher and Flg. Off. E D. H. Davies.

Golf.

The Air Ministry Golfing Society held their Summer meeting over the West Hill club's course at Brookwood on June 2 Mr. R. L. Megarry and Sq. Ldr. A J. Brown tied for the first scratch prize with scores of 83. Mr. Megarry also won the medal handicap with a return of 83—5=78. The results and leading returns were :—

VICKERS LIMITED

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The above illustration shows a Vickers "Vanguard" (23 Passenger) Aeroplane fitted with two Napier "Lion" Engines.

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S.B.A.C.
THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS

EXHIBITORS IN THE PALACE OF ENGINEERING, BRITISH EMPIRE EXHIBITION

WIER CUP (18 holes medal play).—R. L. Megarry, 83—5=78; Sq. Ldr. A J. Brown, 83—4=79; Wing Cdr. A. Shekelton, 88—9=79; J. T. Cotton, 94—15=79

SCRATCH PRIZE.—R. L. Megarry and Sq. Ldr. A J. Brown tied at 83.

LONDONDERRY CUP (BOGEY FOURSOMES).—Sq. Ldr. C. W. H. Pulford and Flt. Lt. W. F. Dickson 4 down, Flt. Lt. D. F. Fitzgibbon and Flt. Lt. R. Gambier-Parry 4 down.

The Middle East Dinner.

The Middle East Dinner, which is now definitely one of the important annual events of the R.A.F. was held at the Café Royal on June 3. Air Vice-Marshal Sir Geoffrey Salmond presided over a gathering of more than a hundred officers who had served under him in the Middle East but one regretted to note that none of the later Middle East people were present. One suggests that an effort should be made to bring those who now control Iraq and Palestine without occupation into touch with those who first occupied Mesopotamia so effectively.

In proposing the toast of the Guests Sir Geoffrey remarked that the last dinner was held on Derby Day. If it had been held on the previous night Middle Easters might have found tips for the three first horses, whose names were all connected with them. Papyrus and Pharos obviously belonged and the third horse, Parth, suggested the path which the R.A.F. Middle East had prepared to the Far East. This path it would be noted was now being followed by aviators of all other nations such as M. Doisy, the Portuguese aviators, and the Italians who flew to Japan four years ago. This year, the dinner being on the eve of the Derby, he had studied the entries carefully but could find no connection with the Middle East except the very remote one of a horse named Salmon(d) Trout.

Sir Geoffrey bore witness to the splendid work which had been done by Sir Samuel Hoare as Secretary of State for Air in building up the strength of the Air Force in the East.

Sir Samuel Hoare, lately Secretary of State for Air, in reply said that Sir Geoffrey's remarks about himself reminded him of two famous quotations, that which one saw in obituaries "No flowers by request" and that from Alice in Wonderland "The carpenter said nothing but 'The butter's spread too thick.'" His own close insight into the work of the Air Ministry led him to believe that in days contiguous to Derby Day the personnel worked very hard—studying Ruff's Guide to the Turf.

Becoming serious Sir Samuel said that no part of the work of the R.A.F. had interested him more than that of the Middle East. He would like to render testimony to the achievements of the Salmond family. Sir John had convinced even unbelievers of the ability of the Air Force to maintain order in Iraq. He himself (Sir Samuel) had gone to the Air Ministry ignorant and inexperienced and whatever he had done was due to the wonderful spirit in the Air Ministry and to the support given him by the officers. He was glad of this opportunity of acknowledging the loyalty which he had received. In these days the R.A.F. was more strongly established in the life of the country than at any time during the War. It would become a much greater force and people would in time recognise the splendid work now being done.

Sir Sefton Brancker referred to the delightful holiday he had had in the Middle East when he took over command for a short period of the perfect fighting machine organised by Sir Geoffrey Salmond. He claimed to his own credit three important acts in connection with the Middle East. In the first place he had discovered Sir Geoffrey Salmond when he was a student at the Staff College who was learning to fly in 1913, he himself (Sir Sefton) being then at the War Office. Secondly, he clamed to have created the Middle East Brigade, in that by order of Lord Kitchener he had pushed off to Egypt the nucleus of what became 30 Squadron, consisting of one Longhorn Maurice Farman, one Shorthorn, and an antiquated B.E.2a—somehow it also acquired a Henry Farman which had been privately owned. Thirdly, as the Palestine front became more important he from his seat in the War Office had sent Sir Geoffrey Salmond to be the first Wing Commander in the Middle East.

He supported Sir Geoffrey's expressions of gratitude to Sir Samuel Hoare for his work at the Air Ministry. He said that Sir Samuel would go down to history as the first Minister of State to use air transport as it should be used. The result of his example could be seen in the previous week when three Ministers of State had travelled safely to the Continent and back by air. Sir Samuel was also responsible for having combined the four air transport companies into Imperial Airways Ltd. and he was also responsible for starting the new airship service.

Brig.-Gen. P. R. C. Groves told the Middle Easters what wonderful people they had been during the War 1914-18 and illustrated his eulogy with newspaper stories which most of his auditors had probably forgotten.

Air Commodore Borton announced that the Australian Minister for Defence was present as a guest and complimented him on the splendid performance of the R.A.A.F. officers who had flown round Australia.

Thereafter the assembly dissolved into groups and reminisced over the happy days of the War till long after midnight.

Army Co-operation.

Replying to the toast of "The Imperial Forces of the Crown" at a dinner given by the Mayor of Westminster on Apr. 9, to meet the Lord Mayor and the Sheriffs and the members of the Finance and Assessment Committees of the Westminster City Council, Field-Marshal Sir William Robertson said that this country should have an Army able to carry out its policy. They could, of course, if they wished have an Army on the lines of disarmament only. It was all very well to talk of disarmament, but if the other people did not take their view where were they? If he were a Minister he should give priority to the Air Force. It was very necessary that they should have an adequate Air Force.

It was not usually considered how serious a matter air fighting would be in the next war. If ever they were again involved in a war, if they were not at least as strong as the enemy in the air the matter would be very serious indeed. The result would very likely depend upon what happened in the first twenty-four or forty-eight hours of the war. There was no way of defending themselves against air attack, so far as he could see, except by having a force superior to that of the enemy. In fact, they had to be superior to the enemy in the Air. It was the duty of every man in the country to see that he got the Air Force which he thought the country required.

AIR AFFAIRS IN PARLIAMENT.

DIRECTORATE OF CIVIL AVIATION.

In the House of Commons on May 2 MR. CASSELS asked the UNDER SECRETARY OF STATE FOR AIR what was the nature of the previous employment of the gentleman who had recently been appointed personal assistant to the Director of Civil Aviation. MR. LEACH said that he had no information regarding the employment of this officer prior to November, 1914, when he was employed at the War Office. In 1915 he enlisted in the R.F.C. serving in all non-commissioned ranks. He was commissioned in March, 1918, and in November of that year was appointed Staff Officer and personal assistant to the D.M.G.P. In July, 1919, he was employed by Aircraft Transport and Travel and in May, 1920, he was employed at the Air Ministry in the Department of Civil Aviation. Since August, 1922, he had been personal assistant to the Director of Civil Aviation

EQUIPMENT OF THE FLEET AIR ARM.

In the House of Commons on May 5, in reply to a question by LIEUT.-COL. MOORE-BRABAZON, the UNDER SECRETARY OF STATE FOR AIR said that the amount spent on new aircraft for the Fleet air arm or for naval co-operation was approximately £180,000 in 1922-23 and £508,000 in 1923-24; the amount spent on new aircraft for independent operations and Army Co-operation was approximately 140,000 in 1922-23 and £775,000 in 1923-24. It was impossible to differentiate the expenditure on engines which, being of common type, were bought for the R.A.F. as a whole and allotted as required. The total amount spent on new engines was approximately £120,000 in 1922-23 and £872,000 in 1923-24

EQUIPMENT OF FIGHTING SQUADRONS.

In the House of Commons on May 5 LIEUT.-COL. MOORE-BRABAZON asked the UNDER SECRETARY OF STATE FOR AIR whether any fighting squadrons of the R.A.F. intended for overland operations as distinct from those intended for the Fleet air arm and apart from squadrons equipped for troop transport purposes, had been equipped throughout with aeroplanes and engines which had been designed or produced since the Armistice in 1918; and, if so, the types of aeroplanes and engines which had been allocated to those squadrons. MR. LEACH said that certain of the squadrons specified had been supplied with aeroplanes and engines designed since 1918 and arrangements were being made to increase their number. He said that it would not be in accordance with the usual practice to publish the particulars asked for in the second part of the question.

ROPE

In the House of Commons on May 5, the UNDER SECRETARY OF STATE FOR AIR informed MAJOR HORE-BELISHA that the Air Ministry used about 65,000 fathoms of rope a year, war stocks of rope were still held and new supplies were obtained by requisition on the Admiralty.

Certain Corrections.

The following letter is of value to those who are taking an intelligent interest in Civil Aviation. One is glad to see that though one's figures (which were accompanied by the word "about") were inaccurate one's views are regarded as sound :—

Sir,—In your article comparing two commercial aeroplanes, you give figures which show that a square foot of the wings of the slower machine will lift 2.2 times as much as a square foot of the other at the same speed and angles. "Something over 70 m.p.h." has been taken to be 73 m.p.h.

This great aerodynamic difference would be very remarkable, since the faster machine has :—(1) A higher lift wing; (2) A greater Gap-chord ratio; (3) A higher aspect ratio. A matter of 10 m.p.h. or more is also docked from its cruising speed.

The correct figures for the fast machine are :—Touching speed, 62 m.p.h.; cruising speed at 1,900 revs., 102 m.p.h. The landing speed of 40 m.p.h for the slow machine is obviously absurd.

The use of the correct figures certainly does not invalidate your argument in favour of low landing speeds, the desirability of which no one would question.

For the De Havilland Aircraft Company Ltd.,

(Signed) G. de HAVILLAND.

[One did not in fact mention wing-loading. One referred only to the number of passengers carried as the normal full load of each type of machine. It is presumably by estimating passengers at 10 stone apiece that Capt. de Havilland arrives at the loading per square foot of the wings. Still, one has never claimed to be a mathematician so one does not dispute his figures.—C. G. G.]

The Gordon Bennett Balloon Race.

The Gordon Bennett Balloon Race will start from Brussels on Sunday, June 15. The following countries will compete :—Belgium, France, Switzerland, Great Britain, United States, Sweden, Italy, and Denmark. The Royal Aero Club has selected two competitors to represent Great Britain :—

Banshee III :—Owner, Mrs. John Dunville; pilot, Sq. Ldr. F. A. Baldwin; assistant, the Lord Edward Grosvenor.—*This is quite a large balloon.*

Margaret :—Owner, Mr. E. Allen; pilot, Capt. C. W. Spencer; assistant, Capt. C. W. Berry.

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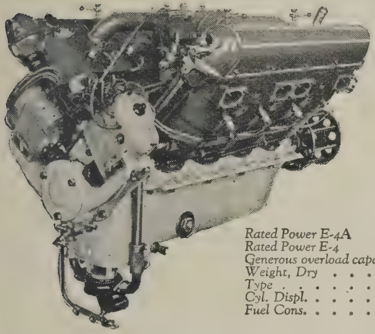

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E-4 and E-4A

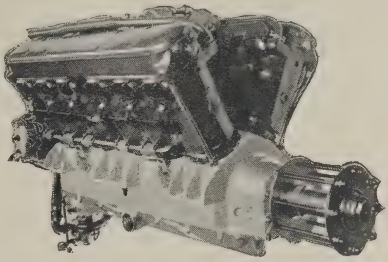
Rated Power E-4A 240 H.P. at 2100 r.p.m.
Rated Power E-4 200 H.P. at 1800 r.p.m.
Generous overload capacity above rated powers
Weight, Dry . . . . 480 lbs.
Type . . . . 8-cyl., 90° Vee
Cyl. Displ. . . . . 718 cu. in.
Fuel Cons. . . . . . . 48 lbs. per H.P. hr.

250 HOUR DURATION TEST

The E-4 was recently tested by the U. S. Govt. for 250 hours at *full throttle* of over 200 H. P. and 1800 revs. It gained power during this run. The extreme dependability is due to 7 years' development on this size and type. The E-4 is the sixth yearly production model and the E-4A the seventh.

WRIGHT T-3—650 H.P.

Rated Power [650 H.P. at 2000 r.p.m.
550 H.P. at 1800 r.p.m.
Generous overload capacity above rated powers
Weight, Dry . . . 1160 lbs.
Type . . . 12 cyl., 60° Vee
Cyl. Displ. . . 1947 cu. in.
Fuel Cons., .45 to .5 lbs. per H.P. hr.
Length 55 3-16" Width 30 7-8"
Heighth 26 1-4"



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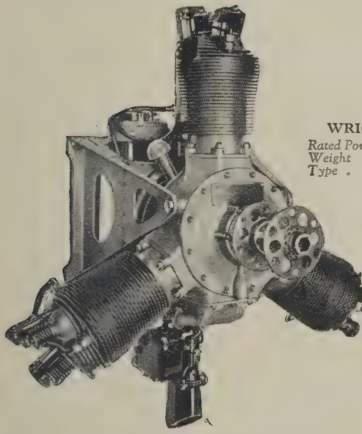
The T-3 was developed for heavy duty in bombing, torpedo and long distance planes. The weight being only 1160 pounds and the overall sizes so compact, it has been found possible to replace lower powered engines in many types of planes. Improved performance results, without loss of radius. Engineers should check the improved performance obtainable with the T-3.



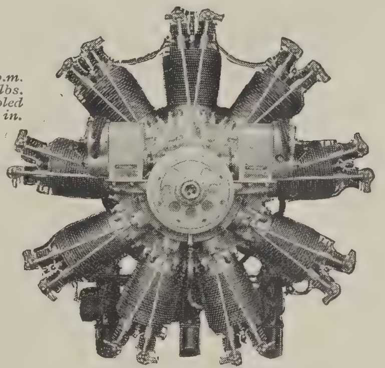
WRIGHT L-4—60 H.P.

Rated Power, 60 H.P. at 1800 r.p.m.
Weight . . . . . . 175 lbs.
Type . . . . 3-cyl., air cooled

The L-4, a dependable 60 H.P., lightweight engine. A very even torque is obtained. It has been flown on hard tests with the spark plugs removed from one cylinder. Low in cost, it is available for small commercial planes as well as messenger, shipboard and submarine planes.

WRIGHT J-3
220 H.P.

Rated Power
220 H.P. at 1800 r p.m.
Weight . . 442 lbs.
Type, 9-cyl., air cooled
Cyl. Displ. 787 cu. in.



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The J-3 is for use in training planes, shipboard planes, seaplanes and small observation planes. Simplicity, lightweight and ruggedness make this a world's leader for 220 H.P.

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H-3 Superfighter, 400 H. P. (Hispano Type). Weight 620 pounds, 8-cylinder, 90° Vee Water Cooled, 1126 cubic inches. F. A. I. world's speed record 500 km. at 164 miles per hour.

THE above five types of engines are all in production and no experimental types are included. Our plant is tooled up to make prompt deliveries on large or small quantities and a few of some types are in stock for immediate shipment. The prices are compatible with new aviation engines built in any other country.

Our Corporation also designs, builds and operates planes. A large staff is employed in cooperating with civil and military airplane designers, manufacturers and operators to incorporate promptly in our engines the recommendations made from flying experience. Enquiries from military, naval and civil sources are solicited.

WRIGHT AERONAUTICAL CORPORATION

PATERSON, NEW JERSEY, U.S.A.

FUEL ECONOMY IN FLIGHT.

In choosing as his subject for the Wilbur Wright Lecture on May 29 the subject of fuel economy in flight, Lt.-Col. H. T. Tizard not only dealt with a matter which is of somewhat greater importance than is often realised, but also with one with which he has very special qualifications to deal. All those who have any knowledge of the work carried out at Martlesham Heath under Col. Tizard's direction during the war will remember that a large amount of work on fuel consumption was one of the distinguishing characteristics of that regime.

Concerning the importance of the subject the lecturer points out that fuel consumption depends on the aerodynamic efficiency of the aeroplane, the thermal efficiency of the engine and the efficiency of navigation as regards the choice of height, speed, and direction of flight under any wind conditions. It is therefore a measure of the overall efficiency of the complete aeroplane, pilot and flying organisation. That there is marked room for improvement in the fuel economy of present-day aeroplanes is shown by the fact that a modern commercial machine operating on the comparatively short London-Paris route at a cruising speed of 100 m.p.h., has to carry as fuel a weight equal to approximately half the pay-load capacity of the machine. Any saving in the weight of fuel means an increase in the pay-load capacity and is therefore considerably more important than the mere saving in cost of fuel. And even if it be true that the fuel bill is a very small proportion of the total cost of running an aeroplane it does not seem rational to argue that a saving in fuel cost may be regarded as unimportant. As Col. Tizard aptly remarks the attitude would be excusable were the possible saving a small proportion of the profits of air transport, but scarcely when it is an appreciable proportion of the losses.

Intellectual Squints.

The subject of fuel economy is a very wide one, and Col. Tizard remarks that to deal with it adequately one requires a sort of intellectual squint. One eye must be fixed on the strictly scientific aspects, the other must wander off to a contemplation of practical realities. It may here be added that fuel economy is far from the only subject that calls for this dual form of contemplation, and that a good deal of really useful technical work in this country suffers severely from the fact that its authors have not cultivated Col. Tizard's "squint."

It is pointed out in the paper that as the work done in flying an aeroplane at any given indicated air speed depends only on the drag which is constant and the air distance covered, air density, and therefore height, only affects the fuel consumption per mile as the result of any effect of density on the overall engine and airscrew efficiency. Within the range of height practicable for commercial aircraft the effect on power-plant efficiency of density is small and it therefore follows that in still air the range of any given aeroplane—or the fuel consumption per mile of that aeroplane—depends only on the indicated air speed and is practically not affected by height.

Height and Fuel Economy.

By flying high on a calm day, time but not fuel, should be saved. Unfortunately this conclusion has never been satisfactorily put to the test, such experiments as were made at Martlesham having indicated an appreciable improvement in fuel consumption as the result of flying high. Owing to the inaccuracy of the instruments and to the imperfection of the carburettor controls available at the time, however, these tests cannot be regarded as reliable, and it is suggested that future tests should be made by measuring the time required to consume a measured amount of fuel instead of relying on flow-meters.

For the present Col. Tizard assumes that the reasoning which leads to the conclusion that height has no influence on fuel consumption is sound. Accepting this proposition it is shown that the miles per gallon of a normal R.A.F. 15 biplane with an airscrew of 75 per cent. efficiency and a fuel consumption of 0.6 lbs. per B.H.P. hour is about 29,000/W where W is the weight of the machine in lbs. This figure actually agrees very closely with the result obtained in a large number of cases, and Prof. Bairstow is called in to support it by the statement that 30,000/W is the approximate mileage per gallon of the light aeroplane. Prof. Bairstow however is scarcely the highest authority on the subject of light aeroplanes, as the figure corresponding to the performance of the A.N.E.C. light aeroplane at Lympne is over 40,000/W land miles per gallon in a very unfavourable wind—corresponding to an air mileage per gallon of something approaching 50,000/W.

The Effect of Wind.

At the same time it has to be remembered that the influence of wind on the practical performance of the aeroplane is so great that the mileage per gallon in still air is a figure largely of academic interest. In still air it is immaterial at what height one flies. In a wind it is only immaterial if the wind speed changes with height inversely as the square root of the density. This condition sometimes holds, but in general the wind speed increases at a more rapid rate with height and then the rule holds that it is better to fly low against wind and high with it. If on the other hand the wind speed is constant over a given range of height it will pay to fly high against the wind and low with it.

It has to be remembered, however, that these rules only apply when the fuel consumption of the engine is kept at the minimum possible by the proper use of the altitude control. If this is not fitted or not used fuel is invariably wasted by flying high, and if any real advantage is to be taken of the possibilities of a choice of level when flying in a wind some system which will ensure correct use of the carburettor altitude adjustment is necessary.

Practical Speed Limits.

The lower the speed of the aeroplane the less the fuel consumption for a given distance through the air. On the other hand the aeroplane is of no value for transport unless it can compete with other forms of transport in speed under the worst conditions of head wind. Assuming that the cruising air speed should be at least 60 m.p.h. above the highest wind speed likely to be encountered, the necessary maximum speed can be settled from meteorological statistics. It is this maximum speed which settles the fuel capacity required, and once that is settled it is not possible to take advantage of more favourable weather conditions except in so far as they may lead to a reduced fuel bill—for one cannot carry extra load on trips where less fuel is needed because half-empty fuel tanks cannot be used to stow passengers or goods.

Roughly speaking in operating in the vicinity of Britain it is necessary to reckon on encountering head winds of 40 to 50 m.p.h. and hence the standard result that a speed of 100 to 110 m.p.h. is necessary in practice.

Having settled this speed the designer then has to design to secure the lowest possible drag at that speed. Col. Tizard shows that using wings of standard characteristics (R.A.F. 15 biplane) the average loading, i.e., loading when half the fuel has been consumed, should be about 9.6 lbs./sq. ft.—or for the London-Paris route about 10 lbs./sq. ft. at the beginning of the flight. However, the actual change in fuel consumption caused by moderate changes of loading are comparatively small.

Improving the Aeroplane.

Drag may be reduced by the introduction of more efficient wings, but Col. Tizard doubts whether great improvements in this direction will occur in the near future. The reduction of body drag is however another matter. Great improvements can be effected if the purely engineering difficulties can be overcome by such methods as the use of retractable undercarriages. The use of wing radiators which affects a considerable decrease in resistance has already been accomplished—not, unfortunately, in this country. Knowledge of the best form for an aeroplane body is very incomplete. Certain assumptions as to the characteristics of the Curtiss racing machine lead Col. Tizard to the conclusion that the ratio of body drag to weight at 100 m.p.h. in that case is only about half the same ratio for the most efficient British commercial machine. His conclusion is that it is not unduly optimistic to look for a reduction in body drag in the near future of about 40 per cent., which would be about 24 per cent. of the total drag at 100 m.p.h., and even more at higher speeds. Increased airscrew efficiency he does not expect to be of any great importance.

Improving the Engine.

Finally the engine remains. The present multi-cylinder engine suffers under two serious disadvantages. It is impossible to secure uniformity of mixture in all the cylinders, some cylinders always receiving an appreciably richer mixture than others. Also it is impossible to burn completely in the short time available any mixture containing more than about 15 per cent. excess of air. The greater the excess of air the higher the thermal efficiency, and the net result is that the multi-cylinder engine has always a much lower efficiency than can be obtained from a single-cylinder unit of the same size and compression ratio. The problem of distribution is too complex for hopes of a general solution to be entertained.

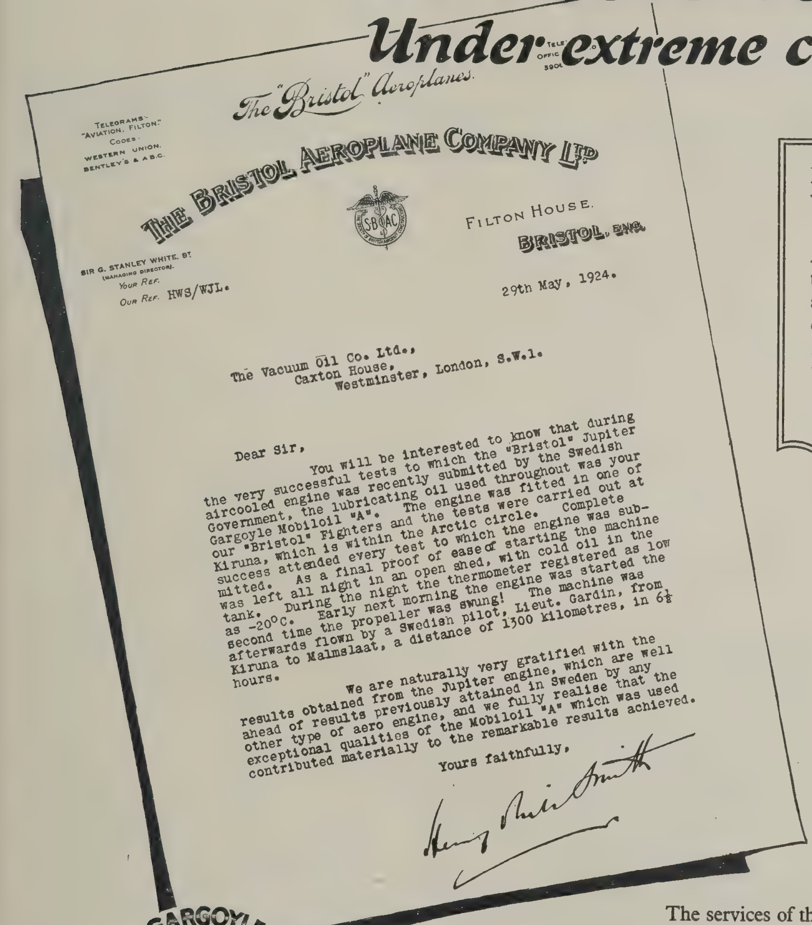
If it becomes possible to explode a petrol mixture in the presence of excess air not only may the difference between the single and the multi-cylinder engine be removed but also the thermal efficiency would improve as the torque diminished if the torque were diminished by reducing the petrol supply and leaving the air supply constant.

Only two practicable methods of securing this end have been suggested. One is that of direct injection of fuel, but Col. Tizard doubts whether engines of this type will be found to be suitable for aeroplanes.

The other it that of stratification—that is of arranging that

Gargoyle Mobiloil for Reliability

Under extreme conditions



The "Bristol" Aeroplanes.

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BRISTOL, ENG.

SIR G. STANLEY WHITE, BT.
(MANAGING DIRECTOR).
YOUR REF.
OUR REF. HWS/WJL.

29th May, 1924.

The Vacuum Oil Co. Ltd.,
Caxton House,
Westminster, London, S.W.1.

Dear Sir,

You will be interested to know that during the very successful tests to which the "Bristol" Jupiter aircooled engine was recently submitted by the Swedish Government, the lubricating oil used throughout was your Gargoyle Mobiloil "A". The engine was fitted in one of our "Bristol" Fighters and the tests were carried out at Kiruna, which is within the Arctic circle. Complete success attended every test to which the engine was submitted. As a final proof of ease of starting the machine was left all night in an open shed, with cold oil in the tank. During the night the thermometer registered as low as -20°C. Early next morning the engine was started the second time the propeller was swung! The machine was afterwards flown by a Swedish pilot, Lieut. Gardin, from Kiruna to Malmslaat, a distance of 1300 kilometres, in 6½ hours.

We are naturally very gratified with the results obtained from the Jupiter engine, which are well ahead of results previously attained in Sweden by any other type of aero engine, and we fully realise that the exceptional qualities of the Mobiloil "A" which was used contributed materially to the remarkable results achieved.

Yours faithfully,

Henry White Smith

ROUND THE WORLD FLIGHT
(U.S. Army Air Service)

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VACUUM OIL COMPANY, LTD.

there shall be a rich mixture surrounding the sparking plug with excess air in the rest of the cylinder. Mr. Ricardo who has pursued the subject of stratification with great persistence has evolved a method of producing a stratified charge which seems simple and effective producing an engine which has a fuel consumption of .45 lbs./B.H.P. hour with a compression ratio of 5/1. There seems no reason to doubt that equal results will be possible with multi-cylinder engines of a size suitable for aeroplanes.

Although the fuel consumption at full torque is only slightly less than that of a normal engine there will be a great reduction in the consumption at cruising torque, and as full power is required only for taking off and climbing it is the economy at cruising power that is important.

Taking into account the possibilities which are now apparent of reducing body resistance and of improving fuel economy. Col. Tizard thinks that the next few years will produce aeroplanes which at 100 m.p.h. have 25 per cent. less resistance and engines consuming 20 per cent. less fuel per B.H.P. hour than those now in service. This means for a 250 mile trip where 40 m.p.h. winds may be encountered (that is roughly London-Paris conditions) an increase in paying load of 20 per cent. and a reduction in fuel cost of over 40 per cent.

In this matter one feels inclined to agree with Col. Tizard in the belief that he is not taking an unduly optimistic view.

THE FUTURE OF AERIAL TRANSPORT.

Reversing the precedent set by the author of " Looking Backwards " Col W. A. Bristow at the Bristol Congress of the Institute of Transport under the title of " The Next Five Years of Aerial Transport " described in some considerable detail the present sad state of commercial aviation. Presumably this is to be taken as an index to the author's faith that within the period mentioned in the title all the present troubles will have been overcome. Many of them undoubtedly could be overcome in that period—but one has grave doubts as to whether they will unless some very profound change in the mental attitude of those who control our aeronautical activities supervenes in the interval.

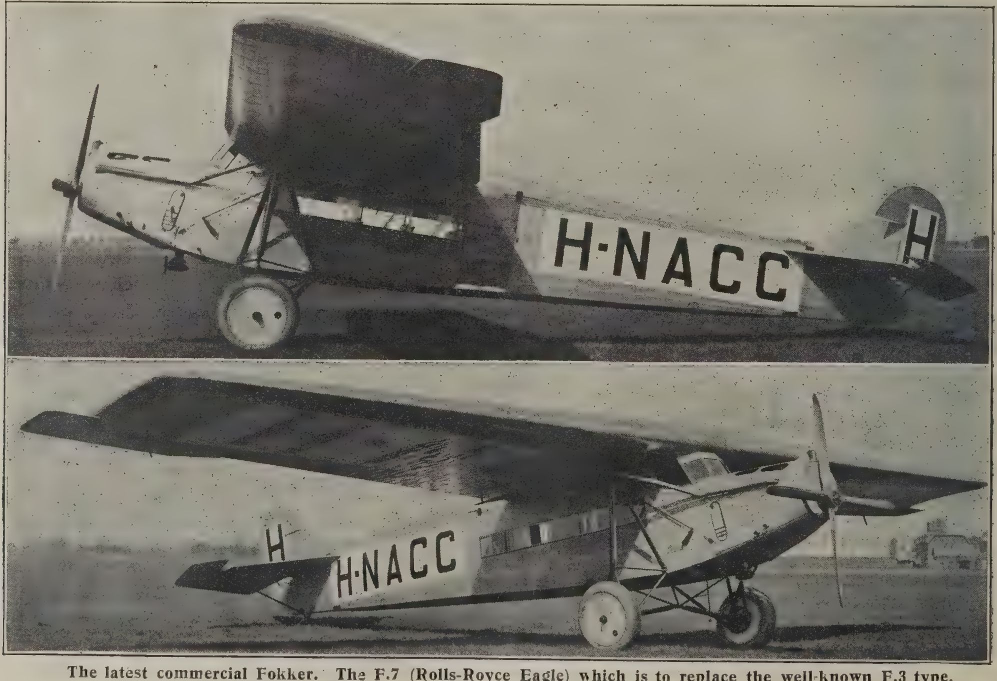
The paper, which deserves longer consideration than can here be given to it, sets out in a very clear manner the practical difficulties encountered in an attempt to make commercial aviation pay under the conditions prevailing on the existing air lines which operate between Britain and the Continent of Europe. One of the first of the items to be discussed is the problem of the violent seasonal variation in the volume of passenger traffic which is encountered. For instance, Daimler Airways in August, 1923, carried 462 passengers, in January, 1923, they carried 9—a maximum/minimum ratio of over 50/1. The cost of keeping machines, pilots and staff standing by in slack periods such as this is obviously enormous and to a very large extent accounts for the very high overall operating costs. The very salutary effect on the seasonal variation of loads and on the load factor of individual machines of the scheme of freight transport inaugurated last year by the Instone line is noted and commended and it seems obvious that there is some very considerable room for an extension of such schemes, particularly in view of the extremely unsatisfactory nature of the provision made by road-rail-and-steamship transport concerns for the carriage of relatively small but relatively valuable goods over any journey which involves their handling by more than one concern.

[To an interested but uninvolved looker-on it would appear that this particular subject touches upon the essential feature of any attempt to develop a new form of transport on really sound lines. A new form of vehicle—however great may be its inherent advantages over existing types—is severely handicapped in any attempt to compete with already existing services. Custom on the part of the public—inexperience of the best form of organisation—the difficulty of raising capital for what is necessarily a speculative enterprise and which usually appears to the public to be much more speculative than it really is, and in many cases the very potent financial and political influence of the interests with which one has to compete all play their part in adding to the difficulties.

The new vehicle, however, escapes from very many of these difficulties if in the first place it is used to provide a service which the more usual forms of vehicle either cannot perform or which their operators have neglected to exploit.

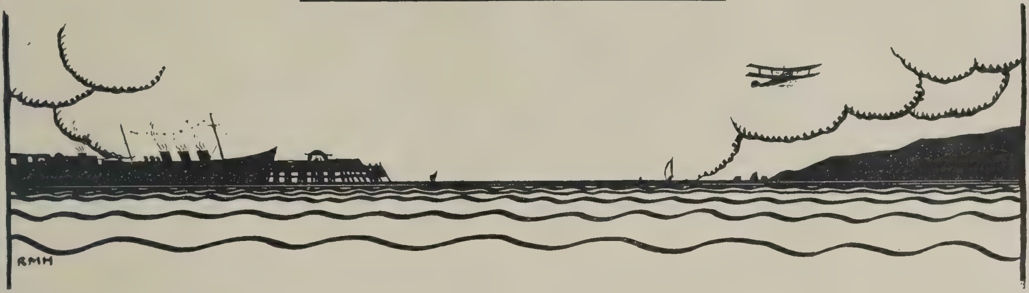
Air services will not succeed commercially for many years if they confine their efforts to an attempt to do somewhat more efficiently and promptly what the very highly-organised railway systems of Western Europe already do fairly satisfactorily. They can be made an almost instant success if at first they direct their main efforts to performing services which the railway systems cannot or will not undertake.]

For the rest Col. Bristow deals at length with the present commercial short-comings of the aeroplane, as represented by its high cost, both prime and operating, and its relative unreliability. High cost follows necessarily from the very low power-weight ratio which obtains in the machine itself—particularly when the total paying load is so inconsiderable a proportion of the total loaded weight. High cost of up



The latest commercial Fokker. The F.7 (Rolls-Royce Eagle) which is to replace the well-known F.3 type.

TRAVEL



The word appeals to every Englishman and every Englishwoman. The British Empire is the result of the desire for knowledge of lands other than the diminutive island which is called "Home" by every citizen of the Empire.

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keep follows from the same cause, in that to maintain the pay-load at even its present figure per h.p. the machine and very particularly the engine have to be constructed as lightly as possible and consequently are extremely highly stressed. Further, the costs of operating are considerably increased by defective terminal facilities which increase the cost of handling machines and loads at the air stations.

Col. Bristow points out clearly the lines along which amelioration of these conditions should come. Increased aerodynamic efficiency will increase total weight carried per h.p., improved structural design and the use of metal framing will increase the ratio between total weight and pay load. Better and lighter and more economical engines will still further increase pay-load per h.p. and reduce the cost of fuel, three-engined machines will mitigate the risks of forced landing and in conjunction with wireless and other signalling devices will remove the difficulties of flying in no visibility.

The use of materials of a more permanent nature than wood and fabric will render the aeroplane a less temporary structure and cut out much of the excessive cost of depreciation.

[With all of these opinions one can express a hearty agreement, but one must again put forward the view that better aeroplanes will be produced when and as there is a market for them. A market for aeroplanes means that a traffic by aeroplanes has been developed, and the present main business facing air transport is to find a traffic not already handled to the general public satisfaction by existing facilities which can be handled by the aeroplane. When they have found this the future will automatically look after itself.]

The Napier Lion Reduction Gear.

The remains of the reduction gear from the first Napier Lion engine fitted to Sq. Ldr. MacLaren's Vulture amphibian which it will be remembered stripped and led to an interruption of his flight at Corfu, have been submitted by D. Napier and Sons Ltd. to Dr. Leslie Aitchison for investigation of the cause of failure.

In a report dated May 26, Dr. Aitchison says :—

> It is evident, therefore, that the gear has been subjected to fatigue stresses above its fatigue limit, otherwise there would have been no cold straining and, therefore, no fracture. The distribution of the cracks is so uniform that there is no doubt that the gear has been uniformly overstressed and the development of the stressing has not been due to any local imperfection. Also the development of sufficient straining to produce season cracking requires a considerable number of cycles. Therefore, it is fair to assume that the overstressing has proceeded for a long time, probably during the whole life of the engine in this machine. There is also no doubt that the Sample A is in all respects better than the Sample C which has successfully endured for 578 hours of normal flying, and the results of the examination of the three samples goes to confirm the view that Sample A has failed definitely as the result of being subjected to higher fatigue stresses than the steel is capable of withstanding. Failure is not due to defective steel, defective heat treatment or bad machining, but is the result of overstressing and fatigue.

It is of some importance that the gear here referred to as Sample C, which has stood up to 578 hours of flight, was taken from a high compression engine, which develops very considerably more power than the low compression type which was used by Sq. Ldr. MacLaren.

In view of the very persistent rumour that Sq. Ldr. MacLaren's machine has been consistently flown with a load very greatly in excess of that for which it was designed, it would seem to be fairly clear that the cause of the numerous unfortunate incidents which have marred the progress of this particular flight are not to be traced to any fault on the part of the Napier engine.

Italian Colonial Aviation.

Italian Colonial Aviation has been fairly active during the recent rebellion in Libia and particularly in assisting in the capture of Beni-Ulid. Despite the unfavourable flying conditions the squadrons stationed at Misurata, Homs, and Tarhuna, have rendered valuable service bombing the rebels, and carrying wounded, food and ammunition across the desert.

During the three months from the occupation of Misurata to the capture of Beni-Ulid, Colonial aeroplanes put up a total flying time of 2,630 hours, covered a total distance of about 260,000 miles, dropped 646 big bombs, 22,700 small bombs, and carried over 145,000 lbs. of supplies and 4,850 lbs. of mail to the land troops operating against the rebels.

Preparing for Speed Records.

According to the French press M. Sadi Lecointe is now putting through preliminary tests a new Nieuport Sesquiplan which is equipped with the new 12-cylinder Hispano-Suiza engine, nominally of 450 h.p. It appears that this machine is destined for an attack on the world's speed record at present held in America by the Curtiss Army Racer.

More Long-distance Flights.

No doubt, inspired by the excellent flight of Lieut. Peltier Doisy from Paris to Shanghai and beyond, the French Press announces four further long-distance flights to be undertaken by French military pilots this summer. The fact that all the officers are well known for their brilliant flying over great distances and that they are all serving officers seems to indicate that the flights are to be recognised officially and assisted by the State.

Lieut.-Col. Vuillemin is to attempt a flight from French Northern Africa to the Cape of Good Hope. Lieut. de Payer is to attempt to fly over the North Pole. Capt. Dagneaux is to fly from Paris to Madagascar and Capt. Girier proposes to fly from Paris to Algiers and back in a day, a distance of 3,000 kilos., taking *café complet* and *dîner* in Paris with *déjeuner* in Algiers.

A Correction.

A note on flying in Holland recently stated that the K.L.M. firm had placed an order for a three-engined commercial machine with the Fokker works and with the Nationale Vliegtuig Industrie, the chief of which is Colonel Walaardt Sacré with Mr. Fritz Koolhoven as chief designer. It has been pointed out that the N.V.I. has accepted the order for a three-engined machine but that the Fokker company has not. There also seems to be some confusion in the second paragraph in that the order reported for four F.K.31 monoplanes with Bristol Jupiter engines placed with the N.V.I. was placed by the Dutch Government and not by the Netherlands Indian Air Service Company.

Southport's Salvation.

A recent outbreak of fire in the office of the Anglo-American Oil Company's Birkdale Depôt at Southport would undoubtedly have resulted in serious damage to the town had it not been for the excellent construction of the depôt, which prevented the flames reaching either the filling house or the main tanks.

There were 16,000 gallons of Pratt's Spirit and 12,000 gallons of paraffin in the tanks, so the Company have cause to congratulate themselves on having planned and constructed their depôt in such a way that disaster was averted. The office itself was completely gutted

PAY-LOADS FOR AEROPLANES?—The photograph shows at the left Mr. Hodges, centre Lord Thomson of Cardington, with behind Sir Sefton Brancker, after arriving on a D.H.50 at Prague. Behind Sir Sefton is Sir George Russell Clarke, our Minister at Prague.

There can be no doubt that the rapid transport of Ministers and high public officials over long-distance journeys is one of the duties which an aeroplane can discharge and existing railways cannot. It is however to be hoped that successful commercial aviation does not depend for its future on a vast increase in the number of such public officials as have occasion to make long and rapid journeys. Socialism means making every man and woman an official (a servant of the State) but at present there are not quite enough officials to make aviation pay its way.

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Extract from "THE AEROPLANE," of 21st May, 1924.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

TRIPS PER DAY.—Monday, 21; Tuesday, 21; Wednesday, 18; Thursday, 15, Friday, 17; Saturday, 17; Sunday, 8.

LONDON—PARIS. LONDON—BRUSSELS—COLOGNE. LONDON—AMSTERDAM—BERLIN:
Imperial Airways, Ltd., machines 53, passengers 220, freight—.
PARIS—LONDON:—
Air Union, machines 42, passengers 117, freight 25,548 lbs.
LONDON—ROTTERDAM:
K.L.M., machines 14, passengers 30.
BERLIN—LONDON:
Aero-Lloyd, machines 2, passengers 3.
SPECIAL MACHINES:
De Haviland Hire, machines 4, passengers 2.
Mr. Courtney, machines 2, passengers 0.

Total number of trips by British machines: 59, carrying 222 pas. Foreign machines, 58, carrying 150 passengers.

COMPARATIVE FIGURES:
For week ending June 8:
Machines, 117; Passengers, 372; Crews, 183; Total personnel, 555.
Corresponding week, 1923:
Machines, 166; Passengers, 345; Crews, 171; Total personnel, 516.
Corresponding week, 1922:
Machines, 134; Passengers, 258; Crews, 175; Total personnel 432.
Corresponding week, 1921:—
Machines, 97; Passengers, 299; Crews, 111; Total personnel, 410.
Corresponding week, 1920:
Machines, 97; Passengers, 299; Crews, 11; Total personnel, 410.

Croydon Notes.

This week has been the best of the year for passenger traffic. In spite of the weather 372 passengers were carried and on Monday June 2 alone 81 people were taken across.

On Wednesday one of the all-metal Dornier monoplanes of the Aero-Lloyd came through from Berlin with mails and one passenger. The machine was piloted by Herr Kahlow who came over last year. He returned on Saturday with a load of freight, mails and two passengers.

On Tuesday Mr. Frank Courtney left Croydon for Amsterdam on an Armstrong-Whitworth Siskin. He returned on Friday. He had been to Holland at the invitation of Mr. Fokker to fly various types of Fokkers and used the Siskin as a runabout. On the same day Mr. Alan Butler returned from Prague on his D.H.37.

The Aircraft Disposal Company are exceedingly busy and Mr. Perry during the week made nine flights on five different D.H.9s. which are being prepared for a foreign Power.

The A.D.C. have now writ their name large for all to see along the top of their huge hangar. Meanwhile at the other side of the aerodrome the old and honoured names of the old firms rear their signs with their accustomed charm on their quondam headquarters as a reminder of those times now fading into history.

The long grass of the aerodrome is now being cut, but only just in time. Had it grown any longer many a D.H.34 and W.8 must have wandered for days out of its depth and the bones erstwhile containing brave souls would, like the famous "something smooth and large and round," found by little Peterkin, have rested in peace until finally disturbed by the mowing machine or ploughshare.

It is at any rate satisfactory to see that the Authorities have not approved of "Letting in the Jungle."

Air Mail Services.

The Postmaster-General announces the restoration, as from Tuesday last, June 10, of direct Air Mail services by morning aeroplane from Croydon to (a) Brussels, serving all Belgium, and (b) Berlin, with a call at Hanover, serving Central and Eastern Germany and also countries beyond. These services will be of special benefit for correspondence (of all classes) posted in the Provinces in time for despatch to London by ordinary night mail.

The Air Mail to Brussels will be closed at the General Post Office, London, at 7.15 a.m. each week-day and will be due to reach the Brussels Post Office at about 1.0 p.m. Letters included in it should normally be delivered in Brussels the same afternoon and in Antwerp the same evening. The special fee payable, in addition to ordinary foreign postage, will be 2d. per oz

The Air Mail to Hanover and Berlin will be closed at the General Post Office London at 6 0 a.m. each week-day and will be due to reach Hanover and Berlin Post Offices at about 3.0 p.m respectively the same day. This Air Mail offers, for express letters, delivery in Hanover and Berlin the same afternoon or evening, and for non-express letters accelerated delivery next day at most places in Northern Germany beyond Hanover, e.g. Hamburg, Berlin and Leipsic, and in Bavaria, e.g. Munich.

By connecting with night mail trains onward from Berlin, it also offers a useful acceleration of letters for Czecho-Slovakia, Austria, Hungary, Poland, Russia and the East Baltic States. The special fee payable, in addition to ordinary foreign postage, will be 3d. per oz,

This morning Air Mail to Hanover and Berlin is additional to the evening Air Mail from London via Rotterdam to Hamburg, recently announced (serving Hamburg district), and to the existing morning Air Mail to Cologne (serving the occupied parts of Germany).

Horse Flies and Foxtrots.

On Saturday June 7 a horse was transported by Farman Goliath from Paris to Amsterdam. One hopes that the machine set a good example to the horse and kept its tail up.

Incidentally, one has always hoped that Mr. Horsey, the excellent pilot of Supermarines on the Southampton-Guernsey service also does this and that the famous foxtrot was not written by an ex-pilot officer after a trip with Mr. Horsey in which the machine struck him as being somewhat tail-heavy.

THE GLOBE TROTTERS.

M. DOISY SEES IT THROUGH.

M. Peltier Doisy arrived at Tokorozawa near Tokyo at 11.27 hrs. on Monday June 9 having started the same day from Osaka. Thus the first of this year's great flights across the World has been successfully accomplished. Probably too little is made of these long-distance efforts, for the strain involved on men, engines and machines (in that order) is terrific. The flight of M. Doisy is a very fine performance indeed, and though perhaps surpassed in quality by the recent effort of Wing Cdr. Goble and Mr. MacIntyre in encircling Australia, it surpasses the Australian flight in quantity.

It should be remembered, however, that Lieuts. Masiero and Ferrarin left Rome on Feb. 14, 1920 and arrived at Tokyo on May 31 of the same year.

The schedule of the flight of M. Doisy and his mechanician Bernard Vésin is as follows:—

April 24, Paris-Bucharest, 1,240 miles; April 25, Bukarest-Aleppo, 930 miles; April 26, Aleppo-Baghdad, 460 miles; April 27, Baghdad-Bushire, 500 miles; April 28, Bushire-Bandar Abbas, 340 miles; April 29, Bandar Abbas-Karachi, 700 miles.

May 3, Karachi-Agra, 700 miles; May 5, Agra-Calcutta, 750, miles; May 9, Calcutta-Rangoon, 650 miles; May 10, Rangoon-Bangkok, 350 miles; May 11, Bangkok-Saigon, 480 miles; May 13, Saigon-Hanoi, 750 miles; May 18, Hanoi-Canton, 500 miles; May 20, Canton-Shanghai, 800 miles; May 29, Shanghai-Peking, 700 miles.

June 2, Peking-Mukden, 409 miles; June 3, Mukden-Pingyang (Korea), 230 miles; June 4, Pingyang-Tai-ku (Korea), 300 miles; June 8, Tai-ku-Osaka (Japan), 425; June 9. Osaka-Tokorozawa (near Tokyo), 295.

Total, 11,500.

THE U.S. ARMY FLIGHT.

Two of the Americans who left Kagoshima (Japan) at 08.30 hrs on June 4 alighted on the Whangpoo river at Shanghai about 15.00 hrs. Lieut. Smith who was delayed by engine trouble arrived the following day at 12.15 hrs. Sergeant Ogden his passenger found promotion to a commission in the U.S. Army awaiting him there. The following day all three machines started again and arrived at Hong Kong, where Lieut. Smith changed a float. They are due to leave there on June 10.

THE PORTUGUESE FLIGHT.

Capt. Brito Paia and Lieut. Sarmento Beires. of the Portu-

THE U.S. ARMY GLOBE TROTTERS :—Left to Right.—Major P. L. Martin, Lieuts. Lowell H. Smith, L. L. Arnold, Leigh Wade and E. H. Nelson.

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guese Army left Calcutta on their D.H.9a on Wednesday June 4, and flew the 325 miles to Akyab which seems to have been Major MacLaren's Waterloo. They left Akyab on June 5 but owing to bad weather they had to return after going a few miles.

The following day they started again and arrived safely at Rangoon. Here they were detained by bad weather and eventually left on Monday June 9 and arrived at Bangkok at 12.45 hrs. after a flight of 5 hrs. 25 minutes.

THE BRITISH EXPEDITION.

The following cable was received from Sq. Ldr. MacLaren by *The Times* under date June 1 :—

The following has been received from Lieut.-Colonel Broome, Tokyo : "Spare machine left Hakodate on May 29 on board American destroyer Paul Jones at 25 knots for Hong-kong direct; due there 8 a.m. June 2. Will tranship during the day to another American destroyer, then leave for Akyab direct. If weather favourable should reach you June 7. Our China Squadron unable to assist. This splendid, prompt, and sporting act is the free gift of America."

If all goes well we should leave Akyab on June 15 and arrive at Tokyo at the end of June.

For Spring Cleaning.

Mr. H. E. Latimer Voight of whom many have kindly memories in connection with the old Integral Propeller Co. Ltd. of Hendon is now with the Great Metropolitan Cleaning Co. Ltd. of 75 Kinnerton Street, Knightsbridge, S.W.1, a firm which specialises on furbishing official and residential premises. The firm's activities include the cleaning of windows, the beating and cleaning of carpets, the polishing of floors and the general renovation of rooms and furniture.

Mr. Voight will be pleased to call personally and give estimates. His telephone number is Victoria 4447.

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and be Safe
TRIPLEX SAFETY GLASS Co LTD
1 ALBEMARLE ST PICCADILLY LONDON W.1.

PERSONAL NOTICES.

DEATHS.

BREWER.—On June 5, at Spittlegate, Lincs., as the result of a collision in the air, Serjt. W. H. Brewer, No. 39 Bombing Sqdn., R.A.F.

COPLESTONE.—On June 5, at Spittlegate, Lincs., as the result of a collision in the air, AC. L. Coplestone, No 39 Bombing Sqdn., R.A.F.

DALY.—On June 5, at Spittlegate, Lincs., as the result of a collision in the air, Rowan Heywood Daly, D.S.C., D.F.C., No. 39 Bombing Sqdn., R.A.F.

LUCAS.—On June 5, at Spittlegate, Lincs., as the result of a collision in the air Leslie Gordon Lucas, Flg. Off., No. 39 Bombing Sqdn., R.A.F.

[The accident at Spittlegate occurred to two D H.9a's during formation flying over the aerodrome. There were nine machines in the air at the time of the collision which occurred at a considerable height.]

USHER.—On June 5, at Northolt, as the result of a flying accident, Flt. Lt. Robert Howell Craster Usher, M.C., A.F.C., No. 41 Fighting Squadron, R.A.F. Flt. Lt Usher was flying a D.H.42 when the accident occurred.

[Flt. Lt. Usher was transferred from the Wiltshire Regt. to the R.F.C. in 1916. In April 1920 he was posted to No. 1 F.T.S., Netheravon, as an instructor and on May 1 1923 he was posted to the Superintendent of R.A.F. Reserve at Northolt. He was stationed at Northolt and attached to the newly formed No. 41 Sqdn. at the time of his death.

Flt. Lt. Usher was one of the finest Rugby forwards in the country and played for the R.A.F against both the Army and the Navy in 1920-21-22-23-24. In the 1923-24 season he led the forwards and in each of the Inter-Service matches he kicked a penalty goal from a remarkable length.

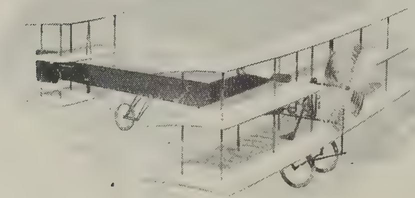
He was captain of the Netheravon Rugby Team 1922-23 when they won the R.A.F Rugby Cup for the first time and his coaching had its effect this year when they won for the second time.]

FORTHCOMING MARRIAGES.

RIDLEY—McALPINE.—The engagement is announced between Flt. Lt. Claud Alward Ridley, D.S.O., M.C., R.A.F., youngest son of Mr. and Mrs. Louis C. Ridley, of Newcastle-on-Tyne, and Royal Crescent, Holland Park, London, and Lillias Elizabeth, eldest daughter of Mr. and Mrs. Robert McAlpine, of Felcourt, East Grinstead, and granddaughter of Sir Robert McAlpine, Bart.

BIRTHS.

BULMAN.—On June 3, at 14, Riverview Gardens, Castlenau, Barnes, to Major and Mrs. C. P. Bulman—a son.



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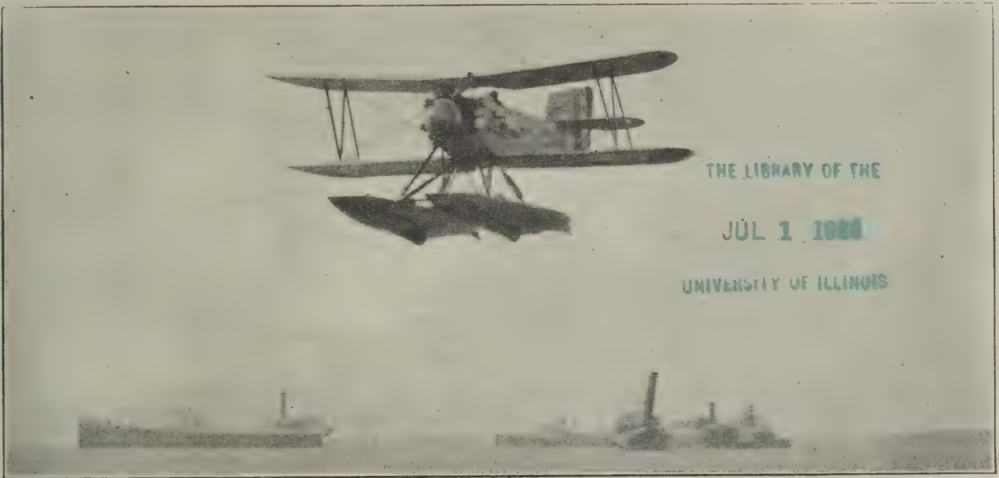
INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXVI. No. 25. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper

A FLEET FIGHTER.



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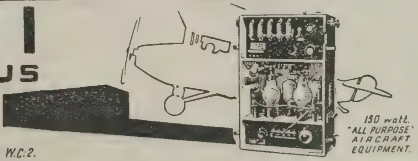
TO PROTECT THE NAVY:—A Fairey Flycatcher (370 h p. Siddeley Jaguar engine), a deck-flying single-seat fighter fitted with float amphibian gear flying over Southampton Water. This was the first machine of post-bellum design to be put into production for the R A.F.



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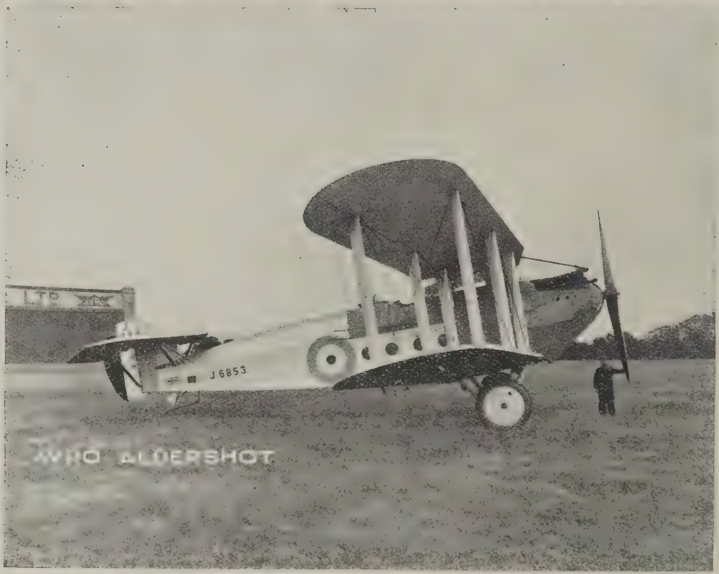

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ON THE ROYAL AIR FORCE PAGEANT.

All readers of this paper are requested to make a large note of the fact that the Fifth Annual Pageant of the Royal Air Force will take place at Hendon with or without the permission of the weather, on Saturday of next week—June 28.

Tickets price 5s. or 10s. each can now be bought from all the usual booking agencies. Boxes (or pens) to hold six persons can be bought at the shop of Mr. Alfred Hays in Bond Street for £4, £5, or £7 according to position. There will also be an enclosure to which the public will be admitted on payment of 2s. at the gate on the Great Day.

Users of automobiles will have to pay 5s. to take their cars into the aerodrome and what will become of the cars afterwards seems to be partly on the knees of the Gods and partly in the hands of that department of the London Police which has at previous R.A.F. Pageants produced such amazingly unanimous dissatisfaction.

Car Parking and The Police.

The official communiqué from the Air Ministry concerning the Pageant says on this particular point :—

> For the convenience of visitors, a new scheme of parking cars has been devised to enable visitors to leave without difficulty at any moment during the course of the afternoon.

So far as one can gather this precious "new scheme" involves some comic sort of "arrow" formation which, though it may enable drivers to "leave without difficulty at any moment during the course of the afternoon," will cause great inconvenience to those who wish to sit in their cars facing the railings and watch the display as is the custom at aerodromes. And it cannot possibly do anything to alleviate the chronic jamb at the gates and in Colindale Avenue and up Hendon Hill when all the cars are going home at the end of the show.

Moreover it will reduce by more than a half the capacity of the car enclosure and if the day should be fine that will mean either of two things, (A) that a vast number of cars will be unable to obtain admission and will be left derelict in the surrounding roads while their occupants walk to the aerodrome (or else go back home in the cars and disgust), or (B) that after the "arrow formation" has been formed with much trouble to the police and annoyance to automobilists, the continued demand for the admission of cars will force the police to abandon their wonderful "new scheme" and let cars find room where they can, with the result that the "arrow" will be surrounded and jambed by other cars so that confusion will be worse than ever confounded when the cars are leaving.

The particular police officials who have mismanaged the parking of cars at previous Pageants do not seem to understand even now that Hendon is not Goodwood or Epsom and that people do not want to leave their cars in a park but want to use them in place of the non-existent grand stands. Why the police, or anybody else wish to bother about people who want "to leave at any moment" passes comprehension. What we aviation people want are visitors who come to see the Pageant, the whole Pageant, and nothing but the Pageant. We are not interested in afternoon callers.

But if provision has to be made for folk who wish to run away early then it is perfectly simple for the multitudinous constables who infest the road from the gate to the enclosures to tell each driver as he comes in that if he wants to leave early he had better stand back by the road and that if he wants to stay late he can go over to the railings.

Also even if the "arrow formation" folly be abandoned at the last minute there should be none of last year's nonsense about parking cars the full length of the railings in two complete ranks before beginning the third, and then completing the third before beginning the fourth, and so on. Some people would rather be in the sixth row near the central enclosures than in the front row at the far end on the top of the hill. And if they prefer that position there is no reason why anybody should object to their having it.

The only thing the police need do is assure that there are lanes through the ranks of cars at right angles to the railings so as to permit the passage of people on foot from the road to the enclosures. If the High Authorities at Scotland Yard will only see to this one little detail they can leave all the rest to the users and drivers of the cars.

One hopes that these few kind words, together with representations from the people in the R.A.F. who are running the Pageant, will have the desired effect. Superintendent Bassom, who now regulates London's street traffic so successfully, knows as much about the problems of regulating cars as does any man living, but one is not sure whether this Hendon problem comes within his radius of action. If it does he will at once see the wisdom of leaving the car-drivers alone. The individual police-constable of to-day is one of the most helpful of London's institutions and his sense of humour and good nature is wonderful, and if the parking at Hendon were left to him and the individual driver there would be no trouble. But somewhere Scotland Yard possesses an official who has an idea that he knows something about parking cars at aerodromes. And the sooner the idea or the official is eliminated the better it will be for the Pageant and those who hope to see it in comfort from their own or their friends' cars.

The Attractions.

That being that, and a matter of some importance it is, there seems to be little to say about the Pageant, for it has already been so well forecast in so many publications.

As a matter of courtesy one puts first the appearance for the first time on record of an *escadrille* (erroneously called a "squadron" in the official communiqué) of the French *Service d'Aviation Militaire*. This will be the crack *escadrille* of the 2nd Regiment from Nancy—the Frontier Defence Force against so-dangerous Germany. The five pilots will be mounted on Type 29 C.1 Nieuports, which will demonstrate how much faster they are than any machine with which any squadron of the R.A.F. is equipped. One hopes that *all* technical experts at the Air Ministry, whether they have ever seen an aeroplane or not, will be ordered to attend this demonstration.

We owe the French Military Authorities a debt of gratitude for sending this *escadrille*. It is certain that the R.A.F. will give the French officers and their mechanics such a reception as will be a lasting memory of their visit to England.

There will be the usual formation-flying and competitions by and between R.A.F. squadrons. And there will be the usual exhibition of new types of Service aeroplanes, mostly designed during or very shortly after the War 1914-20 and now flying in more or less experimental states by kind permission of the Air Ministry experts. There may even be one or two machines which have been designed within the past three years, but it may be taken that the said experts have assured themselves that such machines will not put up such performances as they would have done if their designers had been left free and untrammelled to do their best.

The set piece will be what "The Profession" would probably call a Naval Scena. A putative tramp steamer (British) will be hailed and halted by an apochryphal armed merchantman (presumably Swiss or Czecho-Slovak) and bidden to stand and deliver. A Supermarine Seagull amphibian scout will observe the outrage and will report it by wireless. A formation of Fairey Flycatcher deck-flying fighters will sweep the pirate with machine-gun fire. A formation of Blackburn Dart torpedo-droppers will launch five torpedoes—in proper Navy fashion, as one bomb would do their job. The pirate will be set on fire and amid the usual joyous gas attack on the public enclosures we shall all go home as soon as we can extricate our cars from the tangle in which the police regulation has put them.

But wet or fine, police or no police, it is bound to be a great Day. So that one hopes that everybody who has penetrated so far into these notes, and hundreds of thousands who will never suspect their existence will be there and will contribute to the Royal Air Force Memorial Fund, which is the chief beneficiary from the takings.—C. G. G.

DO NOT FORGET THE R.A.F. PAGEANT ON JUNE 28.

ON NOVELTIES AT THE PAGEANT.

The Air Ministry announces that the R.A.F. Pageant on June 28 is to be graced by a number of new aircraft. It will be observed that in some cases the Air Ministry has quaint ideas as to what constitutes newness. The machines are :—

(A) The Gloucestershire Grebe II single-seat fighter with Siddeley Jaguar engine. The newness here is presumably in the numeral. Though the Grebe is in fact relatively a new type as it dates only from early 1923.

(B) The Hawker Woodcock single-seat fighter with Bristol Jupiter engine. This is so new that even photographs thereof have not yet filtered through for publication.

(C) The Vickers Venture, two-seat fighter with Napier Lion engine. This is in effect the Vickers Vixen after the Air Ministry experts have done with it. The Vixen was at the show given at Croydon for the Dominions Prime Ministers last October.

(D) The Bristol Bullfinch two-seat fighter with Jupiter engine. This machine has been under test and experiment for the past two years at least and appears in the 1922 edition of *All the World's Aircraft*.

(E) The Handley Page Hyderabad medium range night-bomber with two Napier Lion engines. This is no less a novelty than the Handley Page W.8, a type now only four years old which has been fitted to carry bombs instead of passengers. It won the Air Ministry Competition in 1920.

(F) The Vickers Virginia long-range bomber with two Napier Lion engines. This is of even more recent date than the Hyderabad—probably not more than three years old. It was illustrated in the press generally early in 1923 and is in fact an enlarged Vimy.

(G) The Avro Andover is at least a new name. The machine in question is of the ambulance type.

(H) The Bristol Brandon with the Jupiter engine is another ambulance machine. This is the Bristol ten-seater commercial machine of two years ago refurnished for its purpose.

(I) There will also be present the Parnall Pixie and the D.H.53 of Lympne fame.

The French squadron which is to visit the Pageant this year will be mounted on Nieuport 29 C.1 machines with 300 h.p. Hispano-Suiza engines. The distinguished courtesy shown by the French in sending over machines of a type even a little older than the Air Ministry's " new " machines deserves recognition.—W. H. S.

ON AIRWAY FINANCE.

Some ten or twelve days ago a prospectus was published inviting the British Public to subscribe to an issue of £500,000 worth of shares in Imperial Airways Ltd. On June 7 a note appeared in the daily news-sheets stating that the subscription list had been closed the previous afternoon. The promoters of Imperial Airways Ltd. deserve congratulations on the success of their enterprise.

One would like very much to have an opportunity of scrutinising the list of applicants for shares. One has not studied the prospectus itself, partly because one had not the time to spare and partly because high finance is as far beyond the purview of the editor of an aeronautical journal as the wine list of the Café Royal is beyond the vision of a demobilised officer of the R.A.F. But the psychology of those who have obtained or applied for shares in Imperial Airways Ltd. would provide interesting study.

There would seem to be three motives which would inspire people to subscribe to such a flotation. (A) the desire for gain, (B) Commercial or personal interests and (C) Patriotism with a remote hope of a return for one's money—analogous to casting one's dry bread upon the waters in the assurance of its return, possibly somewhat swollen, after many days.

So far as the first motive is concerned one may assume that it was non-existent among the subscribers to Imperial Airways Ltd. " The widow and the orphan who pray for ten per cent "— as Mr. Kipling calls them—can hardly be expected yet awhile to gamble on so remote a possibility as the commercial success of air transport. Therefore one would not be likely to find the ordinary speculator among the shareholders. Nor would one be likely to find the retired business man who likes a safe and steady dividend for the few thousands on which he hopes to live the rest of his life.

The second motive seems more likely, especially if the subscribers had been already concerned with aviation. For example one could imagine Sir Basil Zaharoff, C.B.E., G.C.B., owner of most of Monte Carlo and much of Vickers Ltd. and a Member of the Council of the Royal Aero Club, to whose racing fund he recently contributed 20 guineas, finding out of his own wealth the complete half-million in order to establish an air line to his native Greece and to that Roumania in which he has such great interests. Or one could imagine Sir Amsterdam Mortimer Singer, K.B.E., J.P., whose fortune is attached to this country by the famous American sewing-machine which bears his name, finding a large sum for air transport, seeing that he is still a Member of the Committee of the Royal Aero Club although he has been apparently unavoidably prevented from taking an active part, either personal or financial, in aviation since he presented the Mortimer Singer prize of £500 for amphibian aeroplanes which was won by Mr. Harry Hawker in July 1913. Or perchance the Lord Waring, who is generally understood to have obtained his peerage in connection with aviation, might have put up the money for such a venture out of the considerable wealth which he made during the War 1914-18 from various military equipment all the way from aeroplanes to tents.

The third motive seems the more probable. There are some few big banking concerns who between them could find half a million pounds without noticing it and whose directors are so far-sighted as to see that a net-work of English air lines over Europe will in the distant future become as paying a concern as would be a network of railways under English financial control, and that in the event of war not only would the control of such air lines be a valuable commercial asset but of high strategic value to the nation.

It is the custom to revile English banks for being averse to financial adventure, as compared with American and Continental banks which are prepared to back anything which looks like a promising gamble. The English banker, on the contrary, is prepared to wait for his money and he has moreover that curious Teutonic sentiment which enables him to wait the more cheerfully if by waiting he can help his country's greatness or assure its welfare.

One hopes that the shares in Imperial Airways Ltd. have been acquired by people of such foresight and stability, or by their nominees—for a mere list of shareholders seldom provides any real information as to who controls the shares. In any case Imperial Airways Ltd. has apparently got the money and one wishes good luck to the firm.

All that now remains to be done is (A) to acquire a fleet of new, fast-flying, slow-landing, multiple-engined aeroplanes, (B) to organise proper ground control in the way of signal stations along its routes, and (C) to induce people to travel and send goods by air. And that should be quite simple with the money which is now available.—C. G. G.

AT THE R.A.F. ATHLETIC CHAMPIONSHIPS.—The start for the Mile. AC. Turner, the winner, is the third person from the right, wearing No. 10.

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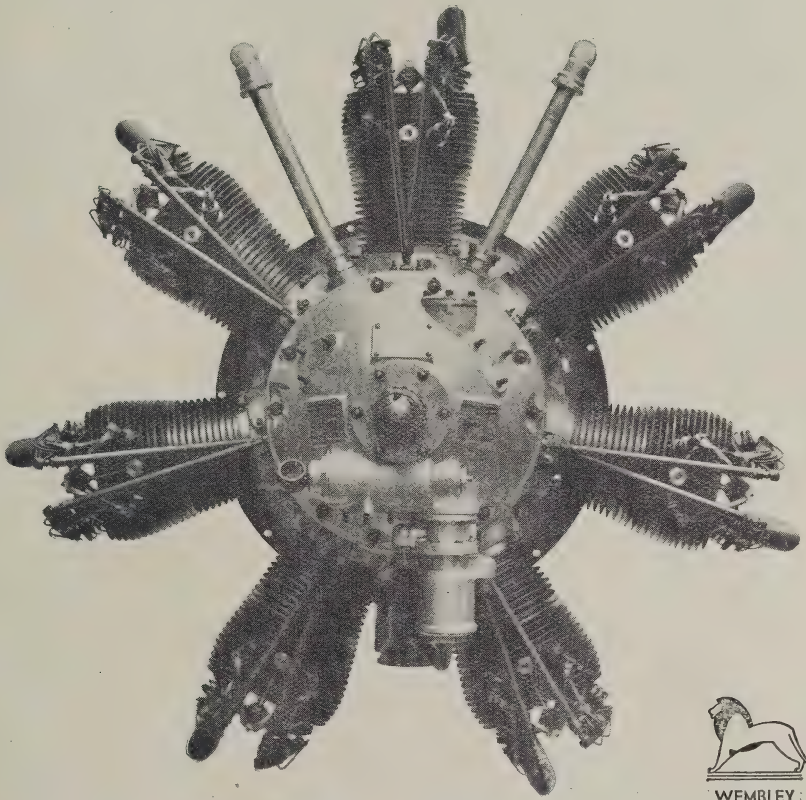

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IRELAND AND AVIATION.—II.

By C. G. Grey.

[Note :—Unfortunately one is obliged to record the fact that while the last article on this subject was in print Northern Air Lines Ltd. were compelled to suspend the Liverpool-Belfast air line. The weather conditions of the past few weeks made flying with the necessary regularity impossible. The stage along the South coast of Scotland has suffered from sea mist, morning fog and low clouds day after day and the clouds over the Lake District have been so heavy that pilots have been compelled to make the detour by the coast. Frequently pilots have taken the direct compass course over sea almost devoid of shipping as the only way of avoiding the low clouds over the land, and that is too dangerous to be permitted as a habit. In spite of all this a 60 per cent. service has been accomplished, which is very good.

To make matters worse the Air Ministry has, so one is told, refused to co-operate with Northern Air Lines in furnishing adequate weather reports. Also the Lisburn Road aerodrome has become waterlogged and several times the pilots have had to take the machines to Aldergrove, 15 miles from Belfast, so as to get off with full load.

New routes are now being considered. One plan is to rail letters and papers to and from Glasgow and use the Renfrew aerodrome as a terminus—but that would not remove the difficulty of bad weather over South-West Scotland. Another scheme, which strikes one as being the best, is to use seaplanes direct from Liverpool to follow the Isle of Man steamer route. One hopes to record very soon a renewal of the service which so far has received from Belfast the support which it so well deserves.—C. G. G.]

North versus South.

There is another, and one hopes remote, use of the Belfast Aerodrome which must be taken into consideration. That is its value in the event of war between the Southern Irish and the Loyal North of Ireland. In such an unhappy event the aerodrome would be very useful indeed, being so close to Belfast. And in the meantime its constant use is educating the people of Belfast up to an understanding of aviation, so that when war comes they will realise the importance of aircraft.

To the ordinary Englishman the idea of serious war between the North and South of Ireland seems absurd. But to those who know the peoples of Ireland it seems quite natural that there should be hostility between the Mediterranean people of Southern Ireland and the Nordics of the North.

So far as the Government of the Irish Free State is concerned there is little fear of war. There are sure to be fierce disputes between the Free State and the North over the boundary question but open war is unlikely. The present rulers of the Free State, if not exactly devoted heart and soul to England, are at any rate sufficiently intelligent to know which side their bread is buttered and to understand that as a self-governing unit of the British Empire they are better off than they would be as a comic little republic without a navy or any considerable air force and with an army which would only be a rabble with elected officers of the same social class as the rank and file. But there is always the danger that the Bolshevik element, which is always strong in the South, may overthrow the Free State and declare a republic under ambitious or fanatical young men of the same kind as those who have raised rebellions and made a mess of the South at intervals ever since Ireland has been known.

Before the last agreement, when the South was still in a state of chaos, there were constantly exchanges of shots between the wild men of the South and the forces of law and order in the North across the disputed boundary zone. And there was then a strong party in the South which openly clamoured for the conquest of the North, among whom was a Mr. O'Duffy whose advice to " use the lead " against the North has become a minor historical phrase.

The " use the lead " party still exists and would be the party in power if a republic were proclaimed. Also it may be noted that the Free State even now claims to represent all Ireland, as may be judged by the postage stamps which present a complete map of Ireland instead of bearing the head of the country's King as is meet and proper, and as is the custom in the Overseas Dominions of the British Empire.

A Super-Tribal Feud.

The quarrel between the North and South is not religious as is commonly supposed. It is purely ethnological. It can hardly be called racial, for the two peoples are of the same race, in that they are all long-headed (or dolicho-kephalic). And it is more than tribal, for the Southerns and the Northerns belong to two widely separated branches of the race.

The Southerns are almost entirely Iberian or even earlier Mediterranean Semitic stock. There are a few degenerate Nordics, descendants of Norman settlers or of Cromwellian or Hanoverian plantations. And there are apparently some remnants of the pre-Iberian Fir-Bolgs, the bullet-headed, long-lipped, prognathous type of distinctly simian aspect, who are presumably descendants of the tribes of Ham who came into Ireland from Africa before the Semitic waves and who mentally and physically are merely bleached niggers. This motley population produces that curious mixture of brains and brutality which accounts for all the eccentricities and atrocities of the Southern Irish in peace and war.

The Northerns are almost exclusively of Nordic stock. The very earliest of them were settlers from Scandinavia, S'Goths or Scots, when Scotland was only inhabited by Picts (c.f. the island of Gothland in the Baltic, the city of Gothenborg, the district and city of Gotha—whence the aeroplanes and our own Royal Family—and the common Scandinavian Christian name Göta). Emigrants from Northern Ireland settled in North Britain and gave it the name of Scotland.

Following these came invading Danes, Norwegians and Jutes—after those countries had developed nations of their own. And after them came a return wave of Scots from Scotland, a kind of double distillation of Nordic blood, with all the defects and virtues of its qualities. After that again came plantations of English puritans of the most Anglo-Saxon type. And still later there were big settlements of French Huguenots, who brought the linen trade to the North and whose descendants are to-day a very powerful influence. It would be difficult to imagine any blood mixture more calculated to be anti-pathetic to the wild and degenerate South.

An Ethnological Allegory.

There was an inspired school-boy who defined a parable as a heavenly story with no earthly meaning. An allegory is much the same thing. But an allegory may help some readers to receive an impression of the essential characteristics of the South and North. It may be found in the story of Salomé, as recently staged at Covent Garden with the music of Richard Strauss and a libretto based on the poem by Oscar Wilde. And it can best be expressed in the words of that master-critic Ernest Newman whose analysis of the opera in the *Sunday Times* gives the right idea as none else has ever given it.

Of Salomé herself he writes :—" You may not like the young lady, but you are bound to admit that, given a person of her mentality, here is the final expression of it. . . . . at the end Salomé is no longer repulsive; she becomes pitiful. We can be angry with conscious perversity, and the Salomé of the first half of the opera is consciously perverse, merely licking her cruel little lips over a new and illicit sensation; but madness stirs in us not anger but philosophic pity, and the Salomé of the last few pages is obviously the victim of a madness to which it is futile to apply any moral standard whatever."

Of the " Prophet " he writes :—" No one in the audience ever feels drawn to him. He is just an unprepossessing moralising bore; this Baptist might have earned some local notoriety as an implacable opponent of the Brighter Jerusalem movement, but no Deity coming to earth would have chosen him out of earth's millions as his forerunner. . . . we no sooner get this big suggestion of Jochanaan as the Prophet than he becomes diminished and vulgarised into Jochanaan as the pulpit-banging local preacher, spoiling a good text by a bad sermon."

Impartial observers who know both the South and North of Ireland will recognise in those two quotations an almost perfect characterisation of the two peoples. Periodically the South becomes deliberately perverse and vicious. After destroying its victims, whom it professes to love with the desire for complete possession—as it desires to-day to possess the North—it ends by going mad and forcing the superior authority to destroy it, as Salomé was destroyed by the shields of Herod's guards.

The black non-conformist North, for all its high moral qualities, is very apt to strike the observer as the portentous moralising bore and opponent of brightness described by Mr. Newman. One may love the South but it is impossible to respect it. One must respect the North but it is difficult to love it.

To-day the South is demanding the head of the North on a charger in the best Salomé manner, after having failed to seduce the North from its allegiance. And it will be interesting to those who have studied the Israelitish origin of the Nordic peoples to consider the idea that the Prophet was assailed by the desires of a Mediterranean because of psychological and ethnological factors precisely similar to those which are the basic cause of the troubles in Ireland.

The Disillusioned North.

Be that as it may, the people of the North have no more

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illusions about the intentions of the South than the Australians have about the intentions of Japan. They know that, in the popular phrase, they are for it as soon as the South finds an opportunity. And they are preparing for the row to the best of their ability.

The Ulster Constabulary are a fine well-disciplined body of men maintained on the same semi-military footing as were the ever-to-be-lamented Royal Irish Constabulary. And they have behind them a volunteer force known as Special Constabulary and composed largely of men who fought in the historic Ulster Division during the War 1914-18. They are all of the same hard uncomprising stock as their leaders, such as Sir James Craig, and on occasion can be as coldly fanatical as their relations the Scottish Covenanters, a state of mind which is far more terrible and very much more effective than the Dervish frenzy of the Southerners.

The mobile wireless equipment used on the Belfast aerodrome may be taken as an index or symptom of the thoroughness with which the Ulster Defence Forces are equipped. These mobile wireless stations are allocated to the Frontier patrols so that help may be summoned from all directions if and when the use-the-lead party from the South make an attempt to raid the peaceful and orderly territory of the North. But they are also intended to serve as field-equipment in any operations which may be necessary on either side of the Frontier.

So far as men and ordinary equipment are concerned the North has no fear of the South. Man for man the Northerners are sturdier and more enduring than the Southerners, as was proved during the War 1914-18. They are better disciplined. They are better officered. They have a staff composed of former Regular officers. And they have behind all that the greatest of all motives, the defence of their own homes.

But the one thing which makes the North uneasy is the fact that the South possesses a certain number of tanks, left in the hands of the Free State Army by a singularly unwise English Government. With these the Southerners may break through any defences put up by the North and so let loose a horde of savages in a prosperous town to loot and destroy in the manner in which the Southern Irish have proved themselves so efficient.

The notion recalls to one's memory a scene on the edge of one of our aerodromes east of Cambrai a week before the Armistice in 1918. Within a radius of half a mile were four wrecked British tanks each bearing the German cross. They had been captured by the German Army in our great retreat in March 1918 and had been used against us in a gallant counter-attack during the German retreat in September or October. All of them had been put out of action by a lieutenant-colonel of infantry using a captured German anti-tank gun—a species of glorified elephant rifle firing a small shell.

Our new tanks are naturally proof against such weapons, but the obsolete tanks owned by the Free State are not. And it ought to be possible for the businesslike Northerners to acquire a few of those effective German guns with an adequate supply of ammunition. So one fails to see where there need be any anxiety.

Free State Aircraft.

The matter of aircraft is rather different. The Free State has at the old R.A.F. Headquarters at Baldonnel a few Bristol Fighters and De Havilland 9s which it has acquired ostensibly with the object of chasing the Republicans who have been in arms against rule by Dublin. Recently one asked for a little information about the Free State Air Force, for use in annual publication called *All the World's Aircraft,* but the youthful flying officer formerly in the R.A.F. who is now dignified by the title of General in the Free State Army was unable to give any. Apparently Free State officialdom has at any rate acquired the English custom of nursing secrets known to everybody but itself. Nevertheless these few machines are quite serviceable as bombers against an enemy which has no aircraft of any kind. The North has none. In the event of war it is probable that the English Government (at any rate the present Government) would refuse to send armed assistance to the North, on the grounds that it refused to recognise a state of war. It would probably insist that the war was only a frontier affray between irregular bands on each side. And so none of our Air Force would be available for the North.

As a matter of policy it would be better to let the two fight to a finish without official help to either from England. Then they would know which was to be master in future. But equally the English Government should leave both sides free to acquire munitions of war and any volunteers they could persuade to join them.

In such case the North would certainly get the more support. The wealth of the North would buy material and the loyalty of the North would attract men. And the fact that it did so would merely be evidence of the mental and moral superiority of the North.

There are only two aerodromes in the North, the old R.A.F. place in the County Antrim to the North of Belfast and the new commercial aerodrome practically in the City. It would therefore be well for the forces of the North to plan out landing grounds in the vicinity of the Frontier.

Also negotiations for the supply of machines and pilots ought to be put in train quietly as soon as possible. It would be purely foolish to be caught unprepared and it never does to take chances. About two flights of modern high-speed fighters ought to be enough to settle the Southern air force and they together with a flight of bombers should be capable of attending to all air work thereafter. It should not be a very expensive proposition, because a small deposit on account for the machines and a small retaining fee for the pilots would be all the immediate expenditure necessary.

Of course we all hope that the dispute will never develop to the point of active hostility but it is necessary to be prepared. And if the North does not wish to emulate John the Baptist too closely it should take the necessary steps. There is always the possibility that a fatuous English Government, like Herod infatuated by Salomé, may behead the North first even though, like Herod shocked into sanity by Salomé's necrophilian dementia, it may have to destroy the South for the good of the community afterwards.

Armand Deperdussin.

The "Times" correspondent writing from Paris on June 12 states :—

> Armand Deperdussin, who was formerly an industrial magnate, but was convicted of fraud in 1917, committed suicide yesterday. He shot himself in a hotel in the Rue St. Lazare, where he occupied a small bedroom, and died in hospital.
>
> Deperdussin was born in Paris 64 years ago The prosperous stage of his career began in 1901, when he came from Brussels to Paris as an employee of a firm of silk merchants. Outside his work in this firm he interested himself in other enterprises. He used great charm and persuasiveness in conducting business, and in ten years made a fortune. He was one of the first men to devote capital to aeroplane making and the development of flying.
>
> In 1911 he made the acquaintance of Béchéreau, the engineer and aeronautical designer, and started an aeroplane factory near Paris. He called in the help of Vedrines and other well-known pilots of the day, and made the Deperdussin aeroplane—the ancestor of the S.P.A.D.—one of the best-known machines on the market He then bought aerodromes at Etampes, Villacoublay, and Reims. He started factories at Le Havre and Juvisy for the construction of motor-boats and seaplanes. He gave many prizes for air competitions.
>
> In 1913 Deperdussin, who had received the Legion of Honour the year before, was arrested and was charged with frauds involving 28,000,000f. (at that time £1,120,000). Four years later he was sentenced to five years' imprisonment, but, owing to the services which he had rendered to the national defence while the aeroplane industry was in its infancy, the actual serving of the sentence was suspended.

A Deperdussin monoplane designed by M. Bêchéreau and Mr. Koolhoven and piloted by M. Prévost won the Gordon-Bennett Race in 1913 and for the first time in the history of human transport covered 120 miles in an hour, that is to say two miles a minute for an hour on end. The victory inspired the Deperdussin personnel to send a congratulatory telegram to "le bon patron" in his prison.

Armand Deperdussin may have been a criminal in many ways, but he sinned on the grand scale like our Whittaker Wright and Jabez Balfour, and if all had gone well with his speculations he, as they might have been, would have been honoured by the Great Ones of the Earth. For his foresight and the services he did to his country much may be forgiven him.—C. G. G.

An Egyptian Air Force.

The "Morning Post" correspondent in a communication from Cairo, dated June 8, states :—

> The Budgetary estimates, which were presented last evening, provide for an increase in the Army effectives and the creation of Naval and Air Forces, the Budget Committee considering that the present strength of the Forces are not sufficient for the defence of the country.

It will be interesting to see whether the Egyptian Government proposes to run its Navy and Air Force with English personnel as its Army was run by "Sergeant What's His Name" in the last century or whether it proposes that officers and men alike shall be natives. If the latter is the intention some gaiety may be added to the aviation of nations.

The Royal Aero Club and Serving Officers.

About 12 months ago it was decided that serving officers of the R.A.F. and officials on duty at the Air Ministry could become full members of the Royal Aero Club for the nominal subscription of £2 2s. per annum.

A large number of serving officers have already joined the Club and the attention of those who have not done so is drawn to this excellent opportunity. The R.Ae.C. is the Governing Body of the Sport of Flying and as such deserves the support of all who believe, as they should, that sporting flying is essential to the welfare of the R.A.F.

DO NOT FORGET THE R.A.F. PAGEANT ON JUNE 28.

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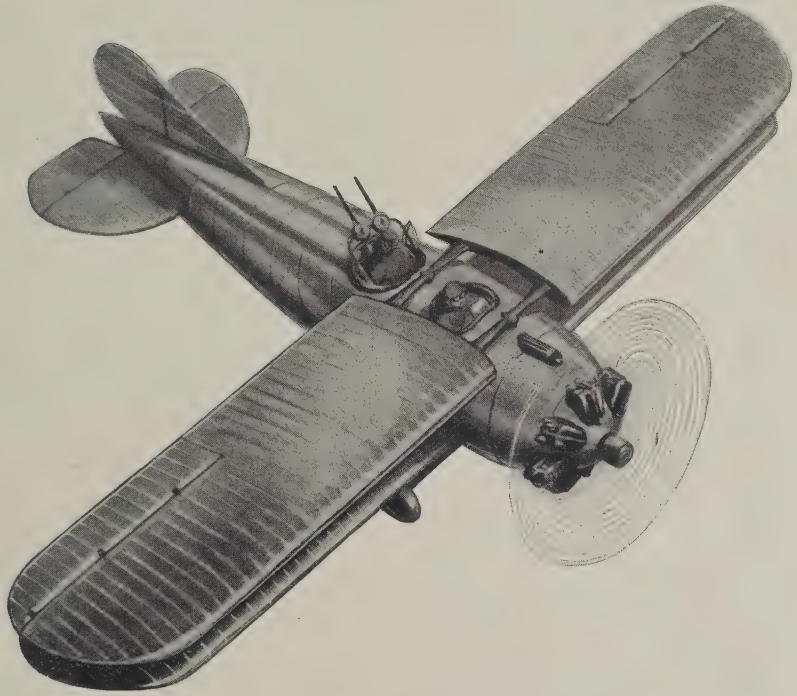

As a result of the most exhaustive tests carried out by the R.A.F. Factory on the "Short" All-Metal Aeroplane, Messrs. Short Bros. have now received an order for further machines of this type. When completed these machines will be the only All-Metal machines, that is to say, machines complete with metallic surfaces, to be made in Great Britain.

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THE ROYAL AIR FORCE.

The London Gazette.

June 10.

General Duties Branch.—The follg. Flg. Offs are granted the honorary rank of Flt. Lt. (May 1):—R. Kennedy; H. T. Herring.

Observer Off. A. C. Walker is transferred to the Res., Class B. (June 8). The S.S. commn. of Pilot Off. on probation R. D. Lawson is terminated on cessation of duty (June 11). Obs. Off. J .H. Gray relinquishes his S.S. commn. on account of ill-health and is permitted to retain his rank (June 11).

Medical Branch.—The follg. are granted S.S. commns as Flg. Offs., with effect from and with seny of the dates indicated:—A. Dickson, M.B. (May 19); A. A. Townsend, M.B (May 27).

Memorandum.—The permission granted to Lt. W. J. Bunting to retain rank is withdrawn on his conviction by the civil power (May 8).

The Fleet Air Arm.

The *Times* on June 17 states:—

The first of the junior officers of the Royal Navy appointed for service in the Air arm of the Fleet under the new arrangement published in April began their training yesterday. In the first batch who have volunteered for service as pilots there are 30 lieutenants, five sub-lieutenants, and six Royal Marine officers, all under 28 years of age.

They joined yesterday the No. 1 R.A.F. Flying Training School at Netheravon, Salisbury, which has been specially allocated for this initial flying training for naval officers. This school was in 1922 placed under the command of Wing Commander John N. Fletcher, A.F.C., who formerly belonged to the Royal Naval Air Service, and was appointed a Flight Commander in the original seniority list of that corps, dated July 1, 1914.

The naval officers' course at Netheravon will last approximately six months, and on its completion the officers will proceed to another shore establishment for further special instruction in naval Air work, preparatory to practical training in aircraft-carriers afloat.

THE R.A.F. SPORTS BULLETIN.

(Issued in collaboration with the R.A.F. Sports Board.)

Lawn Tennis.

R.A.F. v. Staff College, Camberley:—The R.A.F. played their third match of the season at Camberley, on June 14, and after some very closely contested and interesting games the R.A.F. proved victorious by 6 matches to 3.

The results were:—Sq. Ldr. P. Drummond and Flt. Lt. J. Duminy beat Maj. Firebrace and Maj. Newnham, 6—4, 6—4; beat Capt. Robinson and Maj. Leslie Smith, 6—4, 10—8; lost to Capt. Reeves and Capt. Graham, 3—6, 6—1, 7—9.

Sq. Ldr. H. J. F. Hunter and Flt. Lt. F. T. Boucher beat Reeves and Graham, 1—6, 6—1, 7—5; lost to Firebrace and Newnham, 3—6, 2—6; beat Robinson and Leslie Smith, 7—5, 8—10, 8—6.

Flt. Lt. Williamson-Jones and Flg. Off E. Davies beat Reeves and Graham, 6—3, 6—2; lost to Firebrace and Newnham, 6—8, 3—6; beat Robinson and Leslie Smith, 0—6, 6—2, 6—1.

Cranwell.

Cadets' Cricket:—17/5/24 v. Sleaford C.C., away, lost, 72—154; 21/5/24 v. R.A.F., Cranwell, home, won, 131—91; 24/5/24, v. Newark C.C., away, lost, 45—79.

Station Cricket:—21/5/24, v. Cadets, home, lost, 91—131; 22/5/24, v. Notts Amateurs, away, draw, 141 for 8 wkts.—207 for 6 wkts.; 31/5/24, v. Notts University, home, draw, 80 for 3 wkts.—144 for 8 wkts.

R.A.F. Trial Match:—28/5/24, v. No. 3 Group, R.A.F., at Grantham; Cranwell lost by 3 runs. Scores, 1st innings, No. 3 Group 75, Cranwell 19; second innings, No. 3 Group 57, Cranwell 110.

F/Lt. Harrison (Cranwell) was hurt early in the game and did not bat in either innings.

Peshawar.

No. 28 (Army Co-operation) Sqdn. R.A.F., Peshawar, N.W.F.—Résumé of Sports held during Jan. to Apr., 1924:—

Football:—Jan., 1924, 28 Sqdn. v. Islamia College, won, 3—2; v. Rifle Brigade lost, 3—1.

Feb, 1924, v. 34th M.T. Coy., won, 4—0; v. 7th Armd. Car. Coy (R.T.C.), draw, 3—3.

Mar., v. Rifle Brigade, won, 2—0; v. 37th Battery, R.F.A., lost, 2—1; v. British Station Hospital, draw, 1—1.

April, Rifle Brigade, draw, 1—1.

Hockey:—Jan., 28 Sqdn., 1/2nd Punjabs, draw, 2—2; v. "E" Divl. Signls., won, 3—0; v. R.A.F., Risalpur, won, 4—2; v. Islamia College, lost, 2—1.

Feb., v. Police, Peshawar, lost, 3—0; v. 7th Armd. Car Coy (R.T.C.), draw, 2—2.

Mar., v. British Station Hospital, won, 3—0; v. Rifle Brigade, won, 2—0.

Apr., v., 1/17th Dogra Regt., won, 5—2; v. District H.Q., lost, 3—2.

In addition to the attached several Inter-Squadron matches (football and hockey) have been played with great keenness and new talent has been found.

The Inter-Flight Competition for the Barton Cup (presented by Wing Commander R. J. F. Barton, O.B.E., late O.C. of this unit), was played off during the winter season, with the exception of the cricket matches, which could not be carried out owing to limited time available for the Competition. The following results were obtained:—"C" Flight," 52 points (winners); "B" Flight, 48 points; "A" Flight, 32 points (holders).

Manston.

No. 2 Squadron having arrived at Manston "The Airman," the Manston Magazine, promptly published No 6, Vol. III, with a brief but most interesting history of the Squadron from its establishment as the Aeroplane Company of the Air Battalion, R.E., in 1911.

The Sports section of "The Airman" shows that Manston is still as good as ever in this direction. The Boxing season results are remarkably good the team having won every weight in No. 1 Group Eliminating Competitions. They also won the Wakefield Trophy by a few points and were runners-up of the R.A.F. Team Championships. In the Individual Championships Manston produced two winners and three runners-up.

AT UXBRIDGE.—Top, the entry of the competitors. Middle, Lord Thomson and Air Commodore Longcroft inspecting the team captains. Below, the prizewinners being addressed by Lord Thomson.

The Annual Athletic Sports were held on the Aerodrome on May 22. The Cup for the Victor Ludorum, awarded on points, was won by Sjt. Amos (No. 2 Section)

The results of the Sports were:—

Individual Events:— 100 *Yards Flat Race.*—1, AC. Freeman, 3 sect.; 2, Sjt. Amos, 2 sq.; 3, Cpl. Gold, 3 sect.; time 10 secs. 220 *Yards.*—1, AC. Freeman, 3 sect.; 2, Sergt Amos, 2 sq.; 3, AC. Thomas, 1 sect.; time 24 3/5th secs. 440 *Yards (Final).*—1, AC. Freeman, 3 sect.; 2, AC. Morgan, 1 sect.; 3, AC. Taylor, 1 sect.; time 54 3/5th secs. 880 *Yards.*—1, AC. Johnson, 2 sect.; 2, AC. Morgan, 1 sect.; 3, AC. Taylor, 1 sect. 1 *Mile.*—1, AC. Morgan, 1 sect.; 2, L-AC. Cains, 2 sect.; 3, AC. Bailey, 3 sect. 3 *Mile Flat Race.*—1, AC. Johnson, 2 sect.; 2, AC. Morgan, 1 sect; 3, L-AC. Cains, 2 sect. 120 *Yards Hurdles.*—1, Sjt. Amos, 2 sq.; 2, Cpl. Jefferies, 3 sect.; 3, AC. Meldrum, 2 sq. *Long Jump.*—1, Sjt. Amos, 2 sq., 19 ft. 9in.; 2, AC. McIlwain, H.Q. sect., 19 ft. 7 in.; 3, Cpl. Gold, 3 sect., 19 ft. 5 in. *High Jump.*—1, AC. Riseborough, 1 sect., 5 ft.; 2, AC. Barnes, H.Q. sect., 4 ft. 11 in.; 3, Cpl. Gold, 3 sect., 4 ft. 10 in. *Putting the Shot.*—1, AC. Williams, 1 sect., 34 ft. 10 2/3 in.; 2, F/Sjt. Gregory, 1 sect., 34 ft. 7¾ in.; 3, AC. Eggington, 9 sq., 34 ft. 4in. 2 *Mile Walk.*—1, AC. Smethurst, 2 sect.; 2, L-AC. Syles, 2 sq.; 3, AC. Cox.

Team Events.—*Putting the Shot.*—1, 1 Section; 2, 3 Section. *High Jump.*—1, 3 Section; 2, H.Q. Section; 3, 2 Squadron. 1 *Mile.*—1, 2 Section; 2, 1 Section; 3, 3 Section. *Long Jump.*—1, H.Q. Section; 2, 1 Section; 3, 2 Section. 2 *Mile Relay.*—1, 2 Section; 2, 1 Section; 3, 3 Section. 440 *Yards Relay.*—1, 2 Squadron; 2, 3 Section; 3, 1 Section; time 50 1/5th secs. *Tug-of-War* (110 stone).—1, 1 Section; 2, H.Q. Section. 360 *Hurdles Relay.*—1, 3 Section; 2, 1 Section; 3, H.Q. Section. *Ramsgate Town Cup* (1 *Mile Relay*).—1, 1 Section; 2, 2 Squadron; 3, H.Q. Section. 1 *Mile Relay.*—1, 1 Section; 2, 3 Section; 3, H.Q. Section. 3 *Mile Flat Race.*—1, 2 Section; 2, 1 Section; 3, 3 Section; time 15 min. 30 secs. 2 *Mile Walk (Inter-Unit).*—1, H.Q. Section; 2, 1 Section; 3, 2 Section.

Other Events:—*Sack Race.*—1, AC. Barker, 1 sect.; 2, AC. Allsopp, 9 sq.; 3, AC. Lewis, 9 sq. *Tilting the Bucket.*—1, AC. Barker and Miller, 1 Sect.; 2, AC. Beamont and Hatwell, 1 Sect. *Harem Race.*—1, AC. Lewis and Elsie Marsh; 2, S-M. Booker and Mrs. King; 3, AC. Packer and Lillian Grimes *Pillow Fight.*—1, AC. Williams, 1 Sect.; Flt. Sjt. Hastie, H.Q. Sect *Sjts.' Mess Race.*—1, S-M. Walls, 2 Sect.; 2, Flt. Sjt. Martin, H.Q. Sect.; 3, Sjt. ump, 1 Sect. *Officers' Race.*—1, Sq. Ldr. Panter; 2, Flg. Off. Reedman; 3, Flg. Off Roupell. *Boys' Race (under 6 years).*—1, Leslie Morgan; 2, Reginald Crocker; 3, Ronald Pearce. *Boys' Race (over 6 years).*—1, Claude Harry; 2, Vincent Beecham; 3, Stanley McGee.

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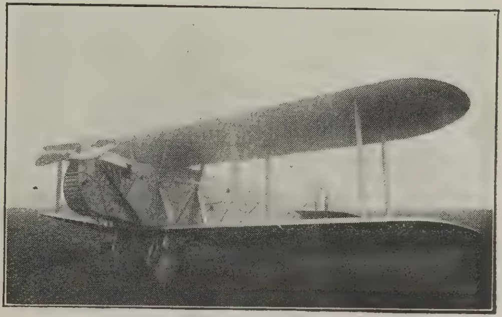

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THE R.A.F. ATHLETIC CHAMPIONSHIPS.

AT UXBRIDGE.—Lord Thomson (Secretary of State for Air) and Air Commodore Longcroft, President of the R.A.F. Sports Board, inspecting the Competitors.

The R. A. F. Championship Meeting began at Uxbridge on June 11. The day's results were :—

Two Miles Walk.—AC. Worrall (Uxbridge) (holder), 15 min. 17 sec., 1; AA. Golightly (Halton), 15 min. 59 secs., 2; AC. Scott (Shotwick), 3.

100 Yards Race.—Sjt.-Maj. Mawby (Cranwell), 1; Cpl. Arthur (Duxford), 2; L-AC. Goodman (Eastchurch), 3; AC. Moffatt (South Farnborough), 4. Won by a foot. Time, 10 1-5 secs.

Half-mile Race.—AC. Oxley (Ruislip), 1; AC. Morgan (Manston), 2; AC. Liddle (Henlow), 3; H Dunn (Calshot), 4. Won by two yards. Time, 2 min. 5 2/5 sec.

Putting the Shot.—The following qualified for the final round :—Flg. Off. Harcourt-Vernon (Andover), 34 ft. 1 in.; Wing Cdr. Patterson (Cranwell), 33 ft. 7 in.; Flt. Lt. Emmett (Eastchurch), 31 ft. 9 in.; Flt. Lt. Boyce (Gosport), 31 ft. 3½ in.; Sjt. Fretwell (Spittlegate), 31 ft. 2 in.; the Rev. Stevens (Cranwell), 31 ft. 1¾ in.

Throwing the Javelin.—The following qualified for the final round :—Sjt. Fretwell, 127 ft. 3 in.; Flg. Off. Harcourt-Vernon, 126 ft. 8 in.; Cpl. Eyles (Uxbridge), 124 ft. 5½ in.

220 Yards Race.—Sjt.-Maj. Mawby, 1; Cpl. Arthur, 2; AC. Caffin (Kenley), 3. Won by eight yards. Time, 23 2/5 sec.

One Mile Race.—AC. Turner (Uxbridge), 1; Cpl. O. C. Clarke (Halton), 2; AC. Morgan (Halton) (holder), 3. Won by two yards. Time, 4 min. 36 4/5 sec.

Long Jump.—The following qualified for the final on Saturday :—Flg. Off. Hadley (Spittlegate), 20 ft. 10 in., and Cpl Gold (Manston), 20 ft. 10 in , 1; L-AC. Goodman (Eastchurch), 20 ft. 9 in., 3; Flg. Off. Nuttall (Farnborough), 20 ft. 6 in., 4; Musician Coole (Cranwell), 19 ft. 11½ in., and Plt. Off. Grey (Duxford), 19 ft. 11½ in., 5.

Quarter-mile Race.—Cpl. Hodgson (Uxbridge), 1; Flg. Off. Howlett (Gosport), 2; AC. Freeman (Manston), 3. Won by six yards. Time, 54 3/5 sec.

Three Miles Race.—AC. Johnson (Manston), 1; AC. Turner (Uxbridge), 2; L-AC. Caines (Manston), 3 Won by 12 yards Time, 15 min. 41 sec.

120 Yards Hurdles.—Flg Off. Hadley (Spittlegate), 1; Flt. Lt. Walmsley (Cranwell), 2; Sjt. Mackay (Cranwell), 3. Time, 17 sec.

High Jump.—The following qualified for Saturday's final.—Flg. Off. Burns (Leuchars), AA. Floyd (Halton), Flg Off. Nuttall (Farnborough), Plt. Off. Moon (Duxford), and L-AC. Gearsley (Kenley), all jumped 5 ft. 3 in.

The second day's proceedings consisted mainly of preliminary team contests. The results were :—

440 Yards Low Hurdles (Final Heat).—Sjt. Lowdell (Duxford), 1; AC. Tame (Calshot), 2; L-AC. Fuller (Cranwell), 3. Won by five yards. Time, 59 4/5 sec.

440 Yards Open Relay (Heat 1).—Cranwell, 1; Manston, 2; Netheravon, 3; Won easily. Time, 46 4/5 sec. *Heat 2.*—Uxbridge, 1; Halton, 2 Duxford, 3. Won by two yards. Time 48 3/5 sec.

360 Yards Junior Hurdles Relay (Heat 1).—Spittlegate, 1; Calshot, 2; Shotwick, 3. Time 56 2/5 sec. *Heat 2.*—Gosport, 1, Ruislip, 2; Shrewsbury, 3. Time, 60 1/5 sec

360 Yards Open Hurdles Relay (Heat 1).—Cranwell, 1; Halton, 2; Time, 57 3/5 sec. *Heat 2.*—Manston, 1; Flowerdown, 2. Time, 59 3/5 sec.

440 Yards Junior Relay (Heat 1).—Farnborough (holders), 1; Calshot, 2 Won by a yard. Time, 48 sec. *Heat 2.*—Halton, 1; Shrewsbury, 2. Foot. Time, 50 secs. *Heat 3.*—Gosport, 1; Spittlegate, 2. Half a yard. Time, 48 3/5 sec.

One Mile Junior Relay (Heat 1).—Shrewsbury, 1; Spittlegate, 2. Time, 3 min. 46 1/5 sec. *Heat 2.*—Calshot, 1; Ruislip, 2; Time, 3 min. 48 sec. *Heat 3.*—Gosport, 1; Farnborough, 2. Time, 3 min. 46 4/5 sec.

One Mile Open Relay (Heat 1).—Cranwell, 1; Halton, 2; Henlow, 3. Won by 12 yards. Time, 3 min. 44 4/5 sec. *Heat 2.*—Uxbridge, 1; Manston, 2; Netheravon, 3. Won by 15 yards. Time, 3 min. 51 secs.

There were no contests on Friday, the finals being decided on Saturday, June 14. The last day opened with a march past of the competitors grouped in their Stations, the Secretary of State for Air taking the salute. With Lord Thomson were Air Vice-Marshal Sir Vyell A. Vyvyan, Air-Commodores Longcroft and Lambe, and Group Captain Bonham-Carter.

The results were :—

Quarter-mile Junior Relay Race.—South Farnborough, 1; Gosport, 2, Calshot, 3. Won by a yard. Time, 48 4/5 sec.

THE R.A.F. CHAMPIONSHIPS AT UXBRIDGE.—The Teams of various stations entering the Stadium.

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AT UXBRIDGE.—Flt. Sjt. Bradbury and AC. Warner pole-vaulting. Cranwell and Manston in the Tug-of-War.

Quarter-mile Open Relay.—Cranwell (Sjt.-Maj. Mawby, AC. Grant, AC. Vernon, and AC. Griggs) (holders), 1; Duxford (Plt. Off. Gray, Flg. Off. Johnson, Plt. Off. Cranswick, and Cpl. Arthur), 2; Uxbridge (Cpl. Hammond, Flt. Sjt. Bradbury, L-AC- Nicholls, and Cpl. Hodgson), 3. Won easily. Time, 46 4/5 sec.

Tug-of-War (88 st.).—Gosport beat Felixstowe by two pulls to none.

Pole Vault.—Flt. Sjt. Bradbury (Uxbridge), 8 ft. 2 in., 1; AC. Warner (Cranwell), 8 ft., 2.

Putting the Shot.—Flg. Off. Harcourt-Vernon (Andover), 34 ft. 1 in.; Wing Cdr. Patterson (Cranwell), 2; Flt Lt. Boyce (Gosport), 3.

Tug-of-War (Open).—Cranwell (holders) beat Manston by two pulls to none.

One Mile Junior Team Race.—Calshot (AC. Dunne, AC. Wright, AC. Jarrett), 6 points, 1; South Farnborough and Ruislip, each 45 points, 2; Shrewsbury, 4; Gosport, 5; Upavon and Martlesham, 6. Time, 4 min. 45 sec.

One Mile Open Team Race.—Uxbridge (AC. Turner, L-AC. Goodall, AC. Sanderson), 16 points, 1; Manston and Halton, 20 points each, 2; Henlow, 37 points, 4; Cranwell, 44 points, 5; Duxford, 59 points, 6. Time, 4 min. 31 2/5 sec.

High Jump.—Plt. Off. Nuttall, South Farnborough, 5 ft. 11 in.; Flg. Off. Burns, Leuchars, 2; L-AC. Dearsley, Kenley, 3.

Throwing the Javelin.—Flg. Off. Harcourt-Vernon, Andover, 174 ft. 7 in., 1; Cpl. Eyles, Uxbridge, 2; Sjt. Fretwell, Spittlegate, 3.

Two Miles Open Relay.—Manston (AC. Johnson, L-AC. Cains, AC. Taylor, and AC. Morgan), 1; Uxbridge, 2; Halton, 3. Won by three yards. Time, 8 min. 44 2/5 sec.

Two Miles Junior Relay.—Calshot (AC. Wright, AC. Jarrett, Cpl. Topping, and AC. Dunne), 1; Gosport, 2; Shrewsbury, 3. Won by seven yards. Time, 8 min 56 sec

350 *Yards Junior Hurdles Relay.*—Spittlegate, 1; Gosport, 2; Ruislip and Shotwick, 3. Time, 55 sec.

350 *Yards Senior Hurdles Relay.*—Cranwell (L-AC Fuller, Sjt. McKay, and Flt. Lt. Walmsley), 1; Flowerdown, 2; Manston, 3. Won by eight yards. Time, 57 2/5 secs.

One Mile Junior Relay.—Shrewsbury (AC. Ousley, AC. Warnell, L-AC. Olney, and AC. Inwards), 1; Gosport, 2; Ruislip, 3. Won by four yards. Time, 3 min. 41 3/5 sec.

One Mile Open Relay.—Cranwell (AC Griggs, L-AC. Fuller, AC. Reynolds, and Sjt.-Major Mawby), 1; Halton, 2; Manston, 3. Won by ten yards. Time, 3 min 37 4/5 sec.

Long Jump.—Flg. Off. Hadley, Spittlegate, 22 ft. 1 in., 1; Flg. Off. Nuttall, South Farnborough, 2; Sjt. Amos, Manston, 3.

High Jump (Team Championship) (Aggregate of Three).—Halton, 15 ft. 7 in., 1; Duxford, 15 ft. 1 in., 2.

Long Jump (Team Championship) (Aggregate of Three).—Manston, 59 ft. 11 in., 1; Cranwell, 57 ft., 2.

Cranwell won the King's Challenge Cup for the Unit scoring the greatest number of points in the Open Competition. They scored 38 points, Manston being second with 36 and Halton third with 29½.

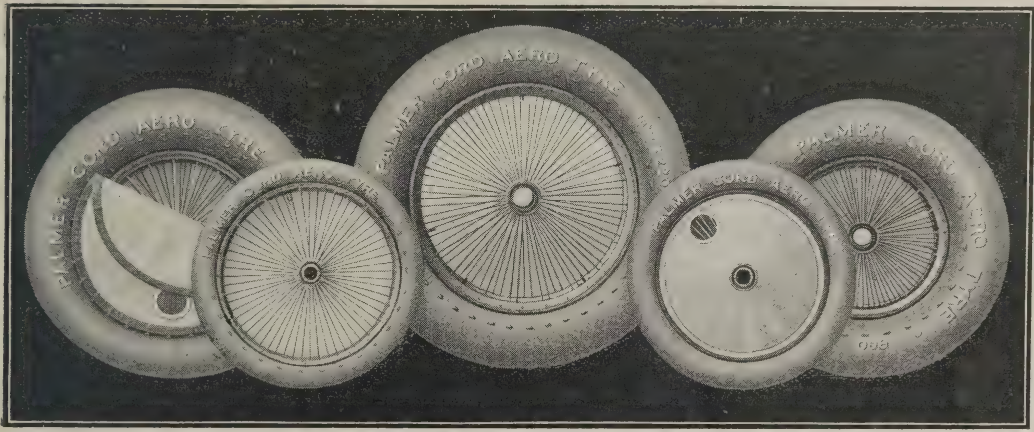
The Air Council Cup for the Unit scoring the greatest number of points in the Junior Competition (stations of less than 500 strength) was won by Gosport with 34½ points, Farnborough second with 28½ and Calshot third with 28.

Lord Thomson who was introduced by Air Vice-Marshal Vyvyan presented the prizes and said that he was too old a soldier to make a long speech but that he would like to thank the competitors for the excellent show they had given. He said that there was no body of men in this country from whom men and women look for more help in the hour of danger than the Royal Air Force and if they were to fulfil the hopes of their countrymen they must be fit and strong and keen. An afternoon like this did much to give confidence among those who saw these sports. Rarely had he seen a fitter body of men. Lord Thomson said he wished to congratulate the prizewinners and sympathise with those who did so well but did not win any prizes. He could not conclude without remarking on the excellent organisation of the sports and congratulating those who had contributed to it.

AT UXBRIDGE.—AC. Turner beating L-AC. Goodall in the Senior Mile. A snap of the hurdlers. The four Calshot lads, Dunne, Wright, Jarrett and Topping, in the first six in the Mile Junior Team Race. The end of the first lap in the Junior Mile.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
700×100	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	161*	185.	55.	135/50
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	150	185.	55.	Central
,,	167	185.	55.	125/60
,,	174	250.	80.	Central
1000×150	201	185.	60.32	125/60
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×220	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 161, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.*
†Wheel No. 169 is fitted with Ball Bearings.

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PARIS 31, Rue la Boétie.

S/NK (240)

CONTROL WITHOUT OCCUPATION.

On June 10 there was published in the London Gazette the first official despatch from an Air Officer Commanding in Chief all British Forces in a territory held for the King. This was the despatch submitted to the Air Council by Air Marshal Sir John Salmond, dealing with the campaigns in Iraq during 1923, and demonstrating the justice of the claim made by Sir Samuel Hoare, then Secretary of State for Air, that the function of the Air Force is "control without occupation." Therefore the despatch deserves to be published in full even if in serial form.

In calling this the first despatch of its kind one does not forget the despatch from Group Captain Robert Gordon after he and Wing-Commander Bowhill had settled the affair of the Mad Mullah in Somaliland in a campaign of six weeks after a war lasting fourteen years. That was a report of a short sharp fight. This is an account of a long series of operations carried out by what would normally be an Army of Occupation but is in fact only a small Aerial Control Force.

The despatch reads as follows :—

Air Headquarters,
British Forces in Iraq,
Baghdad, 22nd May, 1923.

From :—Air Vice Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., Commanding British Forces in Iraq.
To :—The Secretary, Air Ministry, London

SIR,—

1. I have the honour to submit a despatch, covering the period 15th February, 1923, to 30th April, 1923, and describing the operations of certain of the Forces under my Command in Kurdistan up to the latter date.

2. About the middle of February it became evident that the pro-Turk intrigues of Shaikh Mahmoud, Governor of Sulaimaniyah, a man of considerable religious and family influence throughout South Kurdistan, were not only increasing but were developing on a new line.

Evidence came to hand that he had formed a plan to attack Kirkuk in March; that he was in communication with the Shiah Divines of the Holy City of Najaf with the object of raising simultaneously a general insurrection in Iraq; and that he had entered into an arrangement with Ramzi Bey, propagandist Officer acting for Euz Demir, the Turkish Irregular Commander in Kurdistan, for the recapture of Koi Sanjak. With Simko and others he had moreover signed a proclamation (Madhbatah) to Angora promising support to the Turks if the Turkish Government on their part undertook to recognise him as the Ruler of Kurdistan.

3. I considered his activities sufficiently mischievous to need prompt action. A rising in Kurdistan proper may be regarded with equanimity even if the Government set up in Sulaimaniyah should be overturned; but a successful attack on Kirkuk and Koi Sanjak would have had a most disquieting reaction throughout the length and breadth of Iraq.

The Acting High Commissioner viewed the situation in the same light, and Shaikh Mahmoud was accordingly summoned to Baghdad.

4. At the same time two companies of 14th Sikhs were on the 20th February entrained to railhead at Kingerban, and on the following day were flown to Kirkuk, weather conditions having at that time rendered the marching route of six stages impracticable.

5. An evasive reply having been received from Shaikh Mahmoud to the High Commissioner's summons, proclamations were dropped by air warning both Shaikh Mahmoud and the people of Sulaimaniyah that the town would be bombed if he did not comply before sundown on the 1st March. Delay action bombs were dropped outside the limit of the town in emphasis of our intention to enforce compliance.

As the immediate result of this operation Shaikh Mahmoud resigned, 42 notables petitioned for mercy, and a delegation was sent to Kirkuk.

6. However, as Shaikh Mahmoud had not left his Headquarters in the town at the time of expiry of the ultimatum, Sulaimaniyah was bombed, action being confined to his own particular quarter. He fled at once to the neighbourhood of Serdash, from which point he continued to overawe the town and all efforts to set up an administration proved abortive. Up to this point Shaikh Mahmoud had pursued the policy of keeping a foot in both British and Turkish camps. From this moment, however, he definitely seceded.

7. Meanwhile, a very lengthy despatch had been intercepted from Euz Demir to the Commander of the Jezireh front. This despatch confirmed the projected attack on Kirkuk and Koi Sanjak and disclosed in addition plans for an attack on Arbil, to be made in conjunction with the general rising to be engineered in Kurdistan. The rôle which Shaikh Mahmoud was to play in these plans, and his complicity, were clearly defined. Euz Demir had flung his net very wide; in addition to requesting the Persian border Commander to permit the passage of reinforcements via the Urmia road to Rowanduz, he had also invited him to supply irregulars to the Rowanduz area.

8. This point is of importance as the Persian route remains open throughout the winter, while the direct Turkish route from Van to Rowanduz is blocked by snow until the middle of April.

9. The situation which had thus developed was far from satisfactory and, if it was not to be allowed to deteriorate, needed prompt and drastic action. With the forces at my disposal, however, I felt quite confident of my ability to deal with it effectively.

10. The problem which thus confronted me was twofold: to restore the situation in Kurdistan which the Turkish irregular encroachment had disturbed and to strengthen my right flank.

11. This problem affects a belt of country extending from the Northern Frontier, South-Eastwards through Rowanduz, Rania, and Sulaimaniyah. It is bounded on the East and South by the Frontier; while the Western boundary follows the foothills some 15 miles to the East of the line Bastura Chai-Arbil-Altun Keupri-Kirkuk-Kifri. Into this tract a salient is formed by the administrative division of Aqra in the angle of the Greater Zab

12. This belt may be divided into three Sectors, the Northern or Rowanduz Sector, the Southern or Sulaimaniyah Sector, and in between these the Central or Rania Sector.

Of these Rowanduz is the natural gateway from Turkey into Kurdistan. It had long been the base from which Turkish propaganda had been energetically spread by a Staff of propagandist Officers; and their promises had been actively supported by the infiltration of irregular troops and by judicious gifts of ammunition.

The Southern Sector had in the malign and powerful influence of Shaikh Mahmoud, at this time definitely hostile to ourselves, a problem of its own. Some form of Government or local ruler was required in Sulaimaniyah whose influence should be at any rate not actively directed against ourselves.

13. Between these two Sectors, in the angle of the Lesser Zab, South-East of Rania, is located the powerful and warlike Pishder Tribe.

It was most important that its prestige should be discounted.

14. For the above reasons I considered that a combined air and ground operation should be used to attain my twofold objective: to restore the Kurdish situation and to re-secure my threatened flank.

15. In forming my plan many rapidly changing factors had to be considered in the different Sectors and the matter called for immediate decision and most speedy execution.

I therefore called a conference to Mosul for 12th March and in the meantime flew to Kirkuk and Arbil to consult the Political Officers on the spot.

16. Although the situation on the Mosul front was not particularly secure, yet the likelihood of serious hostilities in that area appeared somewhat remote. I accordingly decided to transfer the bulk of my Forces to counter the more immediately threatening danger and issued instructions immediately at Mosul for the formation of two Columns to be called respectively Koicol and Frontiercol.

17. I then returned by air to Baghdad and on the 15th of March despatched my operation orders by air in confirmation of these instructions.

18. Koicol under the Command of Colonel Commandant B. Vincent, C.B., C.M.G., was composed as follows :—

Headquarters, to which was attached a Political Officer and a R.A.F. Liaison Officer.
Brigade Signal Section
R.A.F. Mobile W/T (C.W.) Pack Set.
120th Ambala Pack Battery.
63rd Company Q.V.O. Sappers and Miners.
2nd Batt. The West Yorkshire Regiment (the Prince of Wales' Own).
2nd Batt. The Cameronians (Scottish Rifles).
2nd Batt. 11th Sikh Regiment (Ludhiana Sikhs).
40th Combined Field Ambulance (less 2 Indian Sections).
7th Indian Mobile Veterinary Section.
Pack Transport Train.
A troop of 30 Mounted Police.

This Column was directed to move from Mosul as soon as possible, via the crossing of the Greater Zab at Quwair to Arbil and thence to Koi Sanjak.

19. The rôle assigned to it was as follows :—

(*a*) To hold down the Pishder Tribes; to lower the prestige they had previously acquired; and to prevent them from assisting Euz Demir in the Rowanduz area.

(*b*) To make it impossible for Euz Demir to create a diversion against either Koi Sanjak or Kirkuk by means of the Pishder or through Shaikh Mahmoud at Serdash.

(c) To drive a wedge between Shaikh Mahmoud and the Turks, and by showing greatly superior force in his district, to lower his prestige in Sulaimaniyah to the end that stable Government might subsequently be re-established.

20. Frontiercol, under the Command of Colonel Commandant H. T. Dobbin, D.S.O., was composed of the following units :—

Headquarters, to which was attached a Political Officer, a Military Officer expert in mountain warfare, and a R.A.F. Liaison Officer.
R.A.F. Mobile W/T (C.W.) Pack Set
1 Section Iraq Levy Pack Battery.
2nd, 3rd and 4th Battalions Iraq Levies.
I Machine Gun Company Iraq Levies.
1 Troop of 30 Mounted Police.

This Column was to concentrate at Arbil, after the departure of Koicol, and thence to proceed to and occupy Rowanduz by the following route :—Bastura Chai—Dera—Duwin Kale—Sorak Chai—Khaniwatman—Haji Bejan Pass.

21. At the same the Imperial Column in the area Koi Sanjak—Rania was so placed that, while fulfilling the rôle assigned to it, it was also in a position, if need be, to arrive on the flank of any force which might be successful in holding up Frontiercol. The Columns were in point of fact inter-dependent and either was in a position to assist the other, though I did not anticipate that Koicol would require assistance. The fact that Euz Demir had the advantage of interior lines, I did not consider sufficiently serious to turn the scale against us, more particularly as I had at my disposal, in aircraft and W/T, the means of extremely rapid inter-communication, and of keeping myself in immediate touch with any situation which might arise.

22. For the aerial force in this combined operation the R.A.F. Wing at Mosul, consisting of Nos. 1, 30 and 55 Squadrons was directed to co-operate with the Columns until the arrival of Koicol at Koi Sanjak. Co-operation with Koicol would then be taken over by No. 6 Squadron operating from Kirkuk This Squadron in the meantime carried on intensive air action against Shaikh Mahmoud in the hills in the Serdash district.

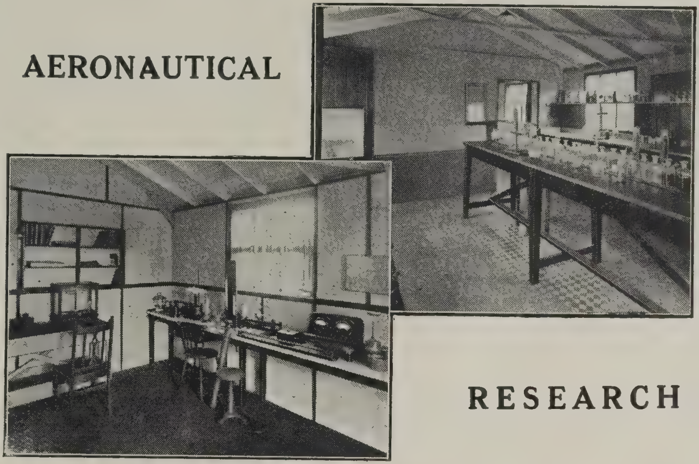
(*To be continued.*)

An Airship Tender.

According to "Aviation" of June 2 an airship mooring mast has been placed on board the U.S.S. "Patoka," now undergoing conversion as an airship tender. The conversion of the "Patoka" will be completed during the Summer and will be the first airship tender of any Navy to be commissioned.

1919——1924

AERONAUTICAL RESEARCH



IF the Aeronautical Engineer is to have the necessary faith in the materials he must embody in his design, it is of utmost importance that he shall have in his hands the means of satisfying himself as to their quality. The illustration shows corners of the Chemical and Physical Laboratories at the Research Department of Boulton and Paul Limited.

In these laboratories questions of the physical, mechanical and chemical properties of steels and alloys; corrosion, dopes—problems which daily confront the Aeronautical Engineer—are dealt with thoroughly as they arise.

THIS advertisement is the second of an interesting series of announcements dealing with the design and construction of Boulton & Paul Aeroplanes, to appear at regular intervals in this journal.

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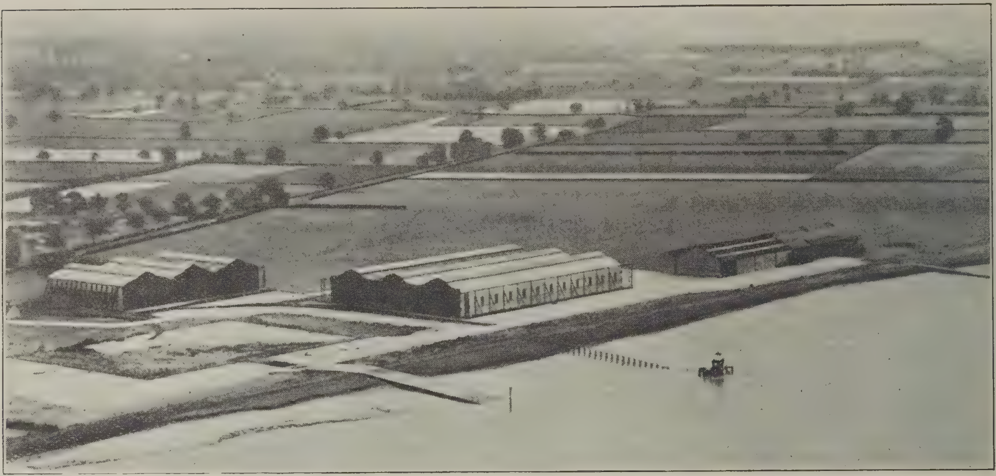
BUILDING AEROPLANES IN YORKSHIRE.

By W. H. Sayers.



The Blackburn Experimental and Erection Works, Aerodrome and Seaplane Station at Brough.

For one reason or another people still insist on attempting to make money by building aeroplanes. It must be extremely difficult for anyone who is not affected by a craving for aircraft to understand how this can be the case. About 15 new aeroplanes per annum is all that the air transport business of this country can absorb at the moment. Quite how many the R.A.F. could absorb one hesitates to suggest, but unfortunately there is some serious impediment in their acquisitive section and—apart from reconditioned war stock—their present consumption is not vastly greater than that of civilian aviation.

It is quite true that those machines which the R.A.F. do acquire are on an average extremely costly. Many of them are of the type usually known as experimental, and in theory at least the Air Ministry pays for them at a rate which should make the building of them a paying proposition. In practice such machines are always built in the hope that they will lead to orders in quantity, usually in works equipped and ready to take such orders. Very rarely do these production orders materialise—and always the capital charges and overhead costs of the works have to be met.

Quite how they are met in many cases remains an impenetrable mystery.

It is not as though the firms which undertake this sort of work reap any considerable amount of public recognition as a reward for the public service they undoubtedly render.

If they do invite a representative of the technical press to inspect their works they have invariably to extract from him a vow that he will not publicly describe any of their more interesting products—for they are pretty certain to be on the Air Ministry's Darkness and Composure schedule.

A Cheering Process.

At the same time one must express gratitude to those manufacturers who still think it worth while to ask one to view their works. It is usually at least a cheering process to see even aircraft to Air Ministry specification actually being made—and at the R.A.F. Pageant of about three years hence one may, perhaps, see those same aircraft or their near relatives again. This of course is thrilling evidence of how insistently progress will occur despite official encouragement.

But the most valuable effect produced by visiting a real aircraft factory is the renewed sense of optimism which it produces in one's mind. To sit week in and week out in an office and to describe the things that could be done and which ought to be done—with the occasional variety of "writing up" some event that should have occurred anything up to five years ago—is a dull way of spending one's time, and not particularly profitable at that.

In an aircraft factory one meets those who are actually doing things. To wrestle with Ministries and yet to produce things that fly is to achieve. Achievement is a matter of faith, courage, and enthusiasm. Personally one would claim in all humility that some degree of these qualities is required to continue writing hopefully about aeroplanes and aviation—but it is not easy to get enthusiasm to bubble in a newspaper office. In an aeroplane factory however enthusiasm is invariably obvious.

If one considers the question dispassionately it is evident that this must be so. Why should anyone build aeroplanes? After all building aeroplanes is not the simplest and easiest method by which to earn one's living. There are many other and distinctly more profitable methods by which anyone having the qualities which make a successful aircraft constructor could earn a reasonably comfortable livelihood, and that without having any serious dealings with Government departments and other such irritant obstructions. Obviously no one would try to build aeroplanes to-day unless he were convinced that that particular business was the only one which would satisfy his innermost instincts. In other words he must have a passion for making things which fly. And it is on people who have that passion that this country now depends for the supply of aircraft.

A Pleasant Prospect.

In the course of time aeroplane building will become a paying business and fall into the hands of the financiers. When that happens I at least shall give aeroplane factories a wide berth—but at present I am all in favour of the scheme whereby it is proposed that the British Aircraft Industry should take over Wembley at the close of the present Exhibition and concentrate all their works there. One of the advantages of this scheme is that it will be a fairly simple process—when the time is ripe—to collect together into one place all the more obdurate of Air Ministry officials and deal with them—gently but firmly—as a single unit.

But more important than this is the fact that I shall be able to cheer myself up by visiting all the aircraft factories at least once a week.

All this—and a good deal more which editorial scrutiny refuses to pass into type—is the outcome of a recent visit to the Blackburn works at Leeds and Brough.

The Blackburn Aeroplane and Motor Company are by no means the most unfortunate of their kind. The Dart torpedo-carrier and the Blackburn fleet-spotter have both been ordered in what nowadays passes for quantity. Moreover they have orders for sundry experimental machines—to wit the Cubaroo with the 1,000 h.p Napier Cub engine, and for certain other craft the names even whereof have not yet been disclosed to me.

At the same time the orders so received are very far from sufficient to keep the works at Olympia fully occupied, neither have the orders been so timed and distributed as to keep the works uniformly busy. Therefore such work as has come their way has not been as profitable as it might have been—for a factory that works by fits and starts is as far from running at its best efficiency as is an engine which is firing with wild irregularity.

The Secret of Continuance.

Still it is very obvious that the staff of the Blackburn works possess that enthusiasm for their work which characterises the industry as a whole. Things being as they are they cannot enthuse over record outputs, but they do over the high standards of workmanship which are habitual to them.

There cannot exist, they are obviously assured, any stock of silver spruce superior to that maintained at Olympia. And their system of inspection is so strict that of that spruce much that others would be glad to use is rejected. Their woodwork is undoubtedly superlative—particularly in such matters as the making of scarfed joints. The finish which is

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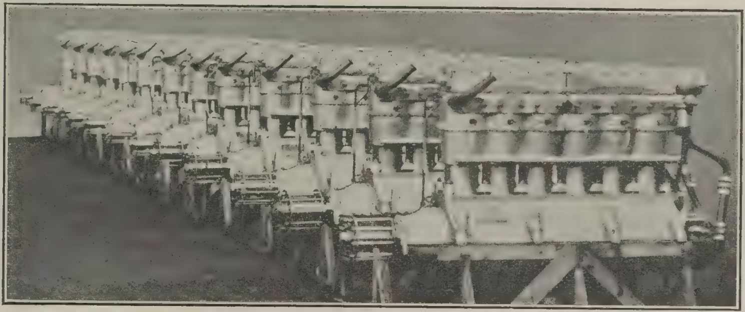

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One of the most simple, economical, and reliable aero engines of the present day is the 240 h.p. Siddeley PUMA.

We have very large stocks of new PUMA engines in addition to a great quantity of spares and we have supplied a large number of these engines to many Foreign Governments, Air Transport Companies and Aircraft Constructors.

The PUMA engine is being used with great success by the following Air Transport Companies.

The Queensland & Northern Territory Aerial Services, Ltd.
The Western Australian Airways, Ltd.
The Belgian S.A.B.E.N.A.
The Copenhagen-Rotterdam Air Line.
The Royal Swedish Mail Air Line (commencing 21st June).
The K.L.M. (Holland).
The De Havilland Aircraft Hire Service.
The Liverpool to Belfast Royal Mail Air Line.
The Seville-Larache Air Line (Spain).

In addition it is expected that PUMA engines will be used in the new 3-engined machines to be employed by Imperial Airways, Ltd.

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put into the wooden components is undoubtedly unnecessarily fine in some cases but faced as they are by intermittent periods of pressure which have to be met by the taking on of workers not continuously employed on aircraft work they find that an insistence on the most perfect of work throughout—whether in the form of unnecessarily fine finish or otherwise—is necessary to set before new hands the requisite standard of care in every detail. And naturally the result does no harm to the firm's reputation.

Finding a Job.

In the matter of plant, the works at Olympia are extraordinarily well equipped. Both in the wood-working and the metal-working departments they have machine tools of the most modern type—all of them obviously extremely well maintained. Of the completeness of that equipment one may judge by the fact that—partly by way of keeping their works more steadily occupied, but largely in order to render the firm independent of external sources of supply—the firm make their own bolts, nuts, strainers, eyebolts, fork-end wire fittings and the like. Anyone who has a working knowledge of machine-shop practice, and who knows the extremely fine limits which are laid down in the B.E.S.A. specification for parts of this type will realise that this is no small undertaking. The outlay in gauges alone for this part of their work must have been very great indeed—and it is quite certain that had the directors taken the normal short-sighted view of immediate commercial expediency, Blackburns would now rely for such supplies on firms who specialised in the manufacture of such small parts.

However such views were not taken, and their policy in this respect has proved to be justified. At the least they are able to keep a number of skilled men in continuous employment who would otherwise have to be sacked in slack periods. In those slack periods parts can be made for stock. When a rush comes those men are available for work of a similar nature but special to the machines actually on order.

Inspection.

Very particularly does this policy help in the matter of the maintenance of the essential inspection department. As has already been mentioned in connection with timber Blackburns' pride themselves on the thoroughness of their inspection both in regard to raw materials and to finished parts.

Incidentally it is worth noting that their inspection staff is very largely composed of disabled ex-service men. The steady production in slack times of such A.G.S. parts keeps the gaugers and viewers occupied and in training at periods when otherwise there would be little for them to do, and relieves them of a good deal of work in busy times which would come on them at rush periods were these items to be imported from other firms.

The whole atmosphere of the works is refreshing. All those at work seem to be conscious that they are doing something worth doing. So far as the staff proper is concerned—and in this category one would include everybody from directors to shop foremen—there is evidence of a feeling that building aircraft is the only job worth doing, and that the best is only just good enough in that job. When people feel like that about their work it takes more than an Air Ministry to stop them from getting on.

At Brough—where components manufactured at Leeds are assembled into complete aeroplanes, and where incidentally all designing and experimental work is carried on—the same atmosphere prevails. Even in the new school for the R.A.F. Reserve that firm faith that the work to be done is the work that matters is found—although apparently the department of the Air Ministry which supplies officers for training has adopted methods not unlike those of the department that orders new aeroplanes for trained officers to fly. However that is—strictly speaking—another story.

The Flying Time recorders at Brough, which serve to keep a check on the amount of work done by each machine in the Blackburn School for R.A.F. Reserve Pilots.

Products.

Having thus described the frame of mind produced by a visit to a really live aircraft factory the reader will doubtless like to hear a little about Blackburn products. Well Blackburns build Dart torpedo-carriers and Blackburn fleet-spotters for the R.A.F. Both these machines should be familiar to all careful readers of The Aeroplane. The Air Ministry however do not like one to say too much about them—nothing like so much as is undoubtedly known to the Naval and Military Attachés of most of the foreign Powers which have an Embassy or Legation in this country.

Also they are building the Cubaroo—a large biplane with the Napier Cub engine of 1,000 h.p. designed to carry a torpedo of the largest size and an unheard-of quantity of fuel. This of course one must not do more than mention—though it is whispered—(but perhaps one had better not). Anyhow Major Bumpus seems to bear up wonderfully. And again there is a project for a—(no the Ministry must not be riled)—and again there is that design for a hull for a—well what kind of flying craft has a hull?—which is an early sign of the presence at Brough of Major Rennie.

And then there is a boat intended for training at the Brough school which is largely concocted by fitting the wings and tail surfaces of a Blackburn fleet-spotter onto a hull, and a modification thereof which may be of military importance.

And again there is the fitting to the old Kangaroo of floats in order to produce a twin-engine training seaplane. At least there is plenty going on—but all that is really interesting must be concealed. After all perhaps it doesn't matter very much. The important fact is that Blackburns are there—that they are keen despite the lean times they have endured—and that when aeroplanes are really in demand they will be able to meet that demand. Perhaps after all the Air Ministry is a blessing in disguise. There is nothing like adversity for the selection of keenness.

An Editorial Addendum.

Captain Sayers has so well described the spirit which animates the whole Blackburn ménage that it is almost unnecessary to add anything on that subject to what he has written. Yet having oneself seen everything that it is permitted to see at the two Blackburn establishments one feels that a certain amount of corroborative evidence cannot be amiss.

In the course of a long and mis-spent life one has had

THE BROUGH FLYING SCHOOL for the R.A.F. Reserve. Left, the Kangaroo which is to be used for twin engine training. Right, some of the staff. From left to right, Mr Loton (instructor), Mr. Stockbridge (instructor), Mr. Dickens (pupil), Mr. Roper (ground engineer), Mr. Rudd (pupil), Mr. Norman Blackburn (Manager), Mr. Fenwick and Mr. Williams (pupils).

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much to do with factories, all the way from working at the bench alongside the British Workman up to having the privilege of expressing as impolitely as possible one's opinions of self-important personages who mismanage important businesses. In the whole course of that experience one has never come across such a collection of combined enthusiasts and humorists as the foreman and charge hands of the Blackburn Works at Leeds. They possess in a marked degree that sane humour to which Mr. Kipling has referred as the salvation of this country. It is no doubt that quality which has enabled the Blackburn firm to survive the slump and to achieve its present quite remarkable success.

It is seldom that success is so well-deserved as in the case of the Blackburn firm. For the benefit of the younger generation it is well to recall that Mr. Robert Blackburn, head of the firm, was one of the very first experimenters with aeroplanes in this country and for years wasted his substance on aeroplanes at a time when such work was regarded as being rather more futile than riotous living. None can grudge him his reward, which is the right to be included among those to whom the Duke of Atholl referred recently in the House of Lords as having made their fortunes out of aircraft.

At Leeds he has at the head of affairs Mr. E. Hudson, a business man of that kindly and shrewd type which is essentially a Yorkshire product, and with him his brother Mr. Charles Blackburn who served in the Army during the War. In Mr. Thompson the firm has a Works Manager whose competence is shown by the firm's products.

At Brough Major Bumpus and Major Rennie have already proved their ability as designers and Mr. Bentley has equally justified himself in charge of the shops. Though the R.A.F. Reserve School is only in process of formation at present the organisation laid down for it by Mr. Norman Blackburn, another of Mr. Robert Blackburn's brothers, is such as to assure its being as successful as the Blackburn manufacturing undertakings. Mr. Norman Blackburn served in the R.N.A.S. during the War and knows just about as much as there is to know about aeroplanes and seaplanes and how to use them.

The aerodrome at Brough is particularly interesting. The sheds are one believes the biggest aeroplane sheds in the World. They were built by the Air Ministry as an Aircraft Acceptance Park where the biggest possible aircraft were to be assembled, and they are big enough to take about the biggest aircraft that we are likely to see in our generation. The foresight and enterprise of Mr. Robert Blackburn is shown in acquiring these valuable premises from the Disposal Board after the War.

The aerodrome itself is quite large enough for the starting and landing of the biggest aeroplanes and, as the accompanying photograph shows, the surrounding country is eminently suitable for school work. Similarly the slipway is big enough to take the largest seaplanes either boat or float machines which we are likely to see. Also the aerodrome is so situated at a bend in the Humber that it is possible for seaplanes to get off in any direction of the wind and in almost any state of the tide.

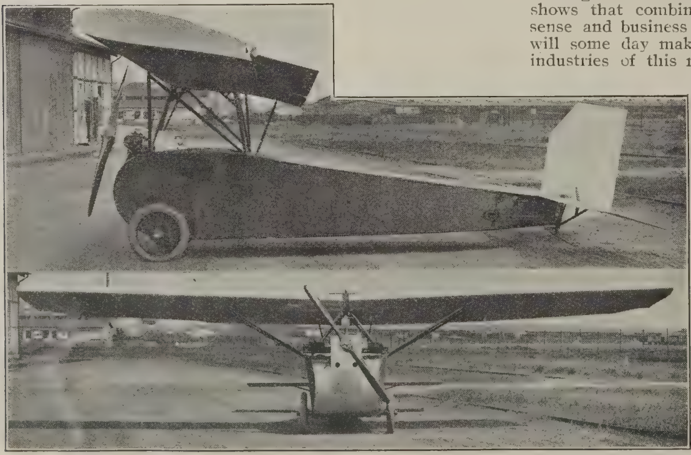
One was particularly struck by the spirit which pervades the School. Mr. Norman Blackburn has somehow or another imparted to it much of the old aerodrome spirit which made Brooklands and Hendon so alluring in the early days of flying and at the same time he has laid down an organisation which assures everything being run with Service efficiency and accuracy.

All the Comforts of a (Nursing) Home.

His system of keeping check on the flying hours of aeroplanes and engines is excellent. And everything is organised on Service lines even down to the provision of an ambulance and first aid station under a humorist who having had experience in the R.A.M.C. combines the job of ambulance driver and first aid artist and daily bewails the fact that owing to the care with which training is conducted he is constantly deprived of his lawful prey. All will hope that his disappointment may be permanent and that he may never have anything more serious to cure than the normal spiked fingers and split thumbs of the workshops.

In Mr. Stockbridge and Mr. Loton the School has two very experienced instructors. The pupils are accommodated in the huts which were originally built for the personnel of the Acceptance Park and the establishment is run as a club which is under the supervision of one Martin, himself a pioneer of aviation who served in the Naval Air Service during its early days at Eastchurch when it was merely a despised branch of the Navy even before it became the Royal Naval Air Service. One is disposed to envy the pupils who have the opportunity of spending a pleasant holiday at this establishment.

Altogether in its various activities the Blackburn firm shows that combination of sound rule-of-thumb commonsense and business ability combined with enthusiasm which will some day make the Aircraft Industry one of the great industries of this nation.—C. G. G.



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The machine has 13.5 sq. m. (146 sq. ft.) of wing and weighs fully loaded 395 k.g. (870 lbs.). The maximum speed is 100 km.h. (62 m.p.h.) and the climb to 1,000 m. (3,280 ft.) takes 15 minutes.

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The Prime Minister.

The Prime Minister, who with Lord Thomson has been at Lossiemouth, had arranged for his mails to be conveyed by aeroplane. The first machine landed in a field on the outskirts of the town on June 11 with correspondence and dispatches and left an hour later.

No. 9 Squadron Dinner.

A Dinner of the Officers who served under the command of Grp. Capt. A. B. Burdett, D.S.O., will take place in London on Saturday, June 28. It is hoped that officers will make every effort to attend. Full particulars from J. V. Barry, Sussex Club, Eastbourne.

The Globe Trotters.

A cablegram from Haiphong to Hong Kong stated that three of the American machines left Haiphong at 10.00 hours on June 11. Two of them arrived at Tourane in the afternoon but Lieut. Smith was forced to land between Hue and Tourane. He has asked for a new engine to be sent from Saigon where a Liberty engine is stored. Owing to storms the stage to the tip of Indo-China has been abandoned.

Lieut. L. C. Schulze of the U.S. Army arrived at Kirkwall on June 13 to make arrangements for the landing of the expedition when they arrive there after leaving Hull.

A Reuter message from Hong Kong dated June 16 states that the U.S. Army pilots arrived at Saigon from Tourane at 2 p.m. on that date.

There is no fresh news of the English team nor of the Portuguese.

A Portuguese Pilots' Strike.

The "Morning Post" of June 4 states :—

A difference between the Minister of War and the Aviation authorities has culminated in a refusal of the aviation officers to accept the appointment of Col. Morais Sarmento as their new Chief. They profess peaceful intentions, but only recognise the authority of the dismissed Chief. Major Cifka Duarte, and have entrenched themselves in the aviation camp at Amadora, near Lisbon, with other troops sympathising with them, including part of the Lisbon garrison. Col Morais Sarmento visited their camp during the night, but although he was admitted to a parley the negotiations failed. The Minister of War expects the incident to end peacefully.

On June 13 the Lisbon correspondent of the *Morning Post* wrote :—

At one time last week the most serious consequences were feared from the quarrel which broke out between the Minister of War and twenty Aviation officers, who entrenched themselves in their camp at Amadora, and refused to surrender unless the War Minister resigned. The affair has now blown over without loss of life or limb, but for six days there were all the elements present of a mutiny of sorts It was asserted that, in the absence of skilled artillerymen, the entrenched airmen would themselves work one of their guns—with possibly dangerous results for curious onlookers. On the other hand, the Minister for War had to ask himself whether the Army would refuse to march against its comrades.

Finally, a force two thousand strong, cavalry, infantry, and artillery, took the field under the command of General Roberto Baptista. The troops gradually closed up, laying a regular siege to the Aviation officers; but the latter, undismayed, refused to alter their attitude, and declared that if the troops came too near they would shoot them. General Baptista resigned and the command was taken by General Bernardo de Faria.

On Friday the *moral* of the besieging army was strengthened by a visit from the President of the Republic; and on the sixth day of the siege the General in command, with forty-nine other officers, advanced resolutely and unarmed, without sword or pistol, into the camp of the enemy, who responded to this mark of confidence by an unconditional surrender.

A Flying Meeting at Vincennes.

Les Ailes of June 13 gives a long account of a successful flying meeting which took place at Vincennes on June 8 and 9. There were about 200,000 people present on the first day and even more on the second day. The arrangements which were in the hands of M. Maurice Fuiet assisted by M. Knipping, were excellent, and the programme was carried through without a hitch. Near the entrance to the aerodrome there was an interesting exhibition of machines. The Union of Civil Pilots undertook the duties of Stewards. Both the Army and Navy Air Services were well represented.

The meeting opened with various flying demonstrations including formation-flying on Nieuports (120 h.p.), looping by Mdlle. Bolland on a Caudron C.27 and some astonishing flying by M. Fronvale on a Morane single-seater, and Lieut. Thoret on a Hanriot 13.

Handicap races were flown and five parachute descents concluded the day's performance.

The second day of the meeting was honoured by a visit from Generals Beres and Gouraud and Colonel Girod. Squadrons of the 34th Regt. visited the meeting flying low in formation over the aerodrome. Further exhibition flying was followed by a bomb-dropping demonstration by M Mauler.

The final of the Grand Prix was then flown over a course of 20 kilometres. This was won by M. Mauler, Mdlle. Bolland being second and M. Knipping third. M. Fronval won the S.D.A. Cup for destroying ballonets, his time being one minute three seconds and the pilot M. Pitot.

Air Affairs in Parliament.

FLYING RISKS.

In the House of Commons on June 6, replying to a question by Lt.-Col. Moore-Brabazon, the Under-Secretary of State for Air said that the salaries of the officials employed in the Directorate of Research were not divisible into proportions corresponding to the flying and the non-flying parts of their duties but represented their work as a whole including flying risks. Mr. Leach said that he had no information that the officers of the Directorate had been instructed by their superior officers not to undertake flying duties because such risks were not covered. There was nothing to investigate and many of these officers were paid at a higher rate than flying officers of the Air Force.

OFFICERS' PAY.

In the House of Commons on June 6, in reply to a question by Sir C. Yates, the Under-Secretary of State for Air said: "The reduction of $27\frac{1}{2}$ per cent. upon the variable 20 per cent. of the pay represents the fall that has taken place in the cost of living since July, 1919. In that month the cost of living was approximately $107\frac{1}{2}$ per cent. above that for July, 1914; the corresponding average figure for the six months preceding March 1924 was 77 per cent., which shows that the cost of living has fallen $30\frac{1}{2}$ points on $107\frac{1}{2}$ or more than $27\frac{1}{2}$ points on 100."

Czechoslovakia.

The following report from the *Times* correspondent at Prague appeared in the *Times* on June 14 :—

A short time ago a series of accidents in the air branch of the Czechoslovak Army attracted so much anxious attention from the public that the Ministry of War appointed a Special Commission to investigate the reasons.

The report of this Commission was read yesterday in the Senate in answer to a question on the subject. From this it appears that altogether only 30 pilots had lost their lives since the Czechoslovak air arm came into being, and that the proportion of fatal accidents to hours flown has steadily decreased year by year since then. For instance, in 1919, there was one fatal accident to every 243 flights. Last year there was only one to every 10,890 flights.

The report draws the general conclusion that the accidents were due rather to mistakes or to loss of presence of mind by the pilots than to bad machines, although in the majority of cases the pilots were fully trained men. The accidents at the Eger Flying School in the spring are explained by the fact that four times as many pilots were now being trained as there were last year.

In addition it may be said that the aeroplanes which are now being built in Czechoslovakia for the Army are of first-class quality. There are now three native aircraft works in Czechoslovakia—the Army factory and those of two private firms

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 13; Tuesday, 16; Wednesday, 17; Thursday, 21; Friday, 15; Saturday, 21; Sunday, 13.

London—Paris. London—Brusssels—Cologne.

London—Amsterdam—Berlin :

Imperial Airways, Ltd., machines 61, passengers 243, freight —

Paris—London :

Air Union, machines, 35; passengers 107, freight —.

London—Rotterdam :

K.L.M., machines 12, passengers 31.

Berlin—London :

Aero-Lloyd, machines 6, passengers 7.

Special Machines :

Surrey Flying Services, machines 2, passengers 3.

Total number of trips by British machines: 63, carrying 246 pas. Foreign machines, 53, carrying 145 passengers.

Comparative Figures :

For week ending June 15 :

Machines, 116; passengers, 391; Crews, 287; Total personnel, 678.

Corresponding week, 1923 :

Machines, 121; Passengers, 378; Crews, 203; Total personnel, 581.

Corresponding week, 1923 :

Machines, 106; Passengers, 168; Crews, 135; Total personnel, 303.

Corresponding week, 1921 :

Machines, 91; Passengers, 300; Crews, 107; Total personnel, 407.

Corresponding week, 1920 :

Machines, 94; Passengers, 194; Crews, 117; Total personnel, 311.

Croydon Notes.

Owing to the absence of G. D. without leave the only available note on Civil Aviation is by another hand, as follows :—

Ballade of Ballast.

Now up, now up, my little fat page
And with " thermos " coffee my thirst assuage,
For the way is long and the morn is cold
And the weather is far from good I'm told.
Now up, now up, in the " thirty-four "
And of ballast and sand provide good store
For the goods be few and the passengers nil
And the mail it weighs like a Beecham's pill.
So let us away for the Gallic shore
For the crossings we make this day be four.
There's a gadget new by the pilot's seat
Like a taximeter, extremely neat
Which tells, my page, as the miles unfold
The subsidy taken, in figures of gold :
Then fill up with ballast and passengers free
And away! with a cargo of subsidee.

" Tailskid."

Employment.

A good pilot is wanted by a joy-ride concern (winter and summer) for Avros (110 Le Rhônes). The wages are about £8 a week plus 2½ per cent. on takings.

Also a ground engineer is wanted licensed for Avros and Le Rhônes.

There is also permanent employment for a good steady middle-aged experienced seaplane pilot who has organising power and whose health can be guaranteed to stand a bad tropical climate. A moderate drinker will be preferred. The work will be from a fixed base and the pay is good.

Good draughtsmen and designers are wanted by several firms.

Applicants are requested to communicate with the Editor of The Aeroplane, 175, Piccadilly, W.1.

A Stockholm-Helsingfors Air Line.

The *Morning Post* correspondent in a message from Stockholm dated June 3 states :—

The air line between Stockholm and Helsingfors was opened to-day in the presence of Royalty and members of the Government. The first machine left Stockholm at 10 a.m., and an aeroplane is expected from Helsingfors to-night. From Helsingfors there is a subsidiary line to Reval, Riga, Memel, and Königsberg. For this traffic only Junker aeroplanes are used.

[N.B.—The correct name of the constructor of the machine is Junkers.—Ed.]

The Round Australia Flight.

The following letter is of interest to all concerned with commercial aircraft :—

Sir,—We have no wish to reflect in any way upon the durability and trustworthiness of our War-time products, but as the recent round-Australia Flight is an historical achievement, we should like to point out, in the interests of accuracy, that the Eagle VIII engine used was not of the War-time type but of the more recent commercial type, which contains certain modifications and improvements, such as friction-anchored gears, corrugated-jacketted cylinders, strengthened type of crankshafts, and sundry minor modifications. Few, if any, of these improvements are incorporated in the Government surplus Eagle VIII engines still in the market.

(Signed) C Johnson (Managing Director, Rolls-Royce Ltd.)

The South Atlantic Anniversary.

The following diary of the fine flight by Commander Saccadura-Cabral and Captain Gago-Continho gives the complete story of the voyage on the Fairey (Rolls-Royce) seaplanes which was completed this week last year :—

March 30th : Left Lisbon (on the Fairey " Lusitania "—Rolls-Royce engine) 07.30 hrs. Arrived Las Palmas 15.00 hrs. Distance 707 miles. Time 7½ hrs.

April 5th : Left Las Palmas 07.00 hrs Arrived Sao Vicente (Cape Verde Islands) 17.20 hrs. Distance 874 miles. Time 10 hrs. 20 mins.

April 17th : Left Sao Vicente 15.30 hrs. Arrived Sao Thiago (Cape Verde Islands) 18.00 hrs. Distance 143 miles. Time 2 hrs. 30 mins.

April 18th : Left Sao Thiago 07.50 hrs. Arrived St. Paul's 19.20 hrs. Distance 910 miles. Time 11 hrs. 30 mins. Machine crashed.

May 11th : (Fairey 16—Rolls-Royce). Left Fernando Noronha 09.07 hrs. Reached St. Paul's Rocks 13,30 hrs. Distance 350 miles. Time 4 hrs. 23 mins. Returning from St. Paul's, forced to land at approximately 15.30 hrs after a total distance flown of 530 miles. Machine lost; crew picked up by s.s. *Paris City*.

June 5th : (Fairey 17—Rolls-Royce). Left Fernando Noronha 08.35 hrs. Arrived Recife 12.15 hrs. Distance 290 miles. Time 3 hrs. 40 mins.

June 8th : Left Recife 08.05 hrs. Arrived Bahia 13.15 hrs. Distance 366 miles. Time 5 hrs. 10 mins.

June 13th : Left Bahia 07.35 hrs. Arrived Seguro 11.50 hrs. Distance 225 miles. Time 4 hrs. 15 mins.

June 15th : Left Seguro 07.50 hrs. Arrived Victoria 11.25 hrs. Distance 263 miles. Time 3 hrs. 35 mins.

June 17th : Left Victoria 09.45 hrs. Arrived Rio de Janeiro 14.30 hrs. Distance 288 miles. Time 4 hrs. 45 mins.

PERSONAL NOTICES.

Deaths.

HILTON-JONES.—On May 31, at Marseilles, suddenly, of pleurisy, Sq. Ldr. Robert Hilton-Jones, O.B.E., R.A.F., dearly-loved husband of Eileen Hilton-Jones, of Badlesmere, Eastbourne.

[Sq. Ldr. Hilton-Jones was one of the earliest of those pilots who were trained in the R.N.A.S. after the outbreak of war. He took his R.Ae.C. certificate at Eastbourne on a Short in September 1914. He did much good service, and in spite of a certain wildness of character he was generally liked by those who served with or under him.]

UNWIN.—On June 1, at Stonyhurst College, John Kennedy Unwin, son of Sq. Ldr. and Mrs. F. H Unwin, aged 14 years.

Forthcoming Marriages.

KNOWLES—INMAN.—The engagement is announced between Sq. Ldr. Reginald Herbert Knowles, M.D., D.P.H., R.A.F., only son of the late H. W. Knowles, M.D., of St. Helens, and Mrs. Knowles, of 5, Rawlinson Road, Oxford, and Gladys Eyre, youngest daughter of Mr. and Mrs. H. R. Inman, of The Grange, West Heath, Hampstead.

Marriages.

BUTCHER—HAWORTH-BOOTH.—On June 11, at Cottingham, East Yorks, by the Rev. A. Ferguson, M.A , Flt. Lt. Frank Leonard Charmbury Butcher, R.A.F. only son of Mr. and Mrs L. W. Butcher, of Campfield Place, Leith Hill, Surrey, to Constance Cordelia, only daughter of Rear-Admiral Sir Francis and Lady Haworth-Booth, of Haworth Hall, Hullbank, Hull.

HORSLEY—SIMS.—On June 14, at Bickley, Kent, Flt. Lt. Clement Flegg Horsley, M.C., R.A.F., No. 14 Squadron, Ramleh, Palestine, son of the late Mr. Arthur Horsley, of Sculthorpe, Norfolk, and Mrs. Johnson, of Victoria, B.C., to Kathleen, daughter of Mr. and Mrs Arthur Sims, of Bromley, Kent.

Births.

HENDERSON—On June 16, at 29, Cleveland Gardens, Lancaster Gate, to Leslie (*née* Deuchar), wife of Flt. Lt. T. Henderson, M.C., A.F.C., R.A.F.—a son.

O'BRIEN.—On June 15, at 46, West Kensington Mansions, W.14, to Mr. and Mrs. R. H. O'Brien—a daughter

PRESTON.—On June 7, at a Nursing Home, Chester, Maude (*née* Stainforth), wife of W. F. A. Preston, R.F.A and R.A.F.—a son.

VENN.—On June 14, to Betty, wife of Flt. Lt. G. O. Venn, of " The Bungalow," Netley Street, Farnborough, Hants—a son.

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INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXVI. No. 26. SIXPENCE WEEKLY. Registered at the G.P.O. as a Newspaper.

JUL 14 1924

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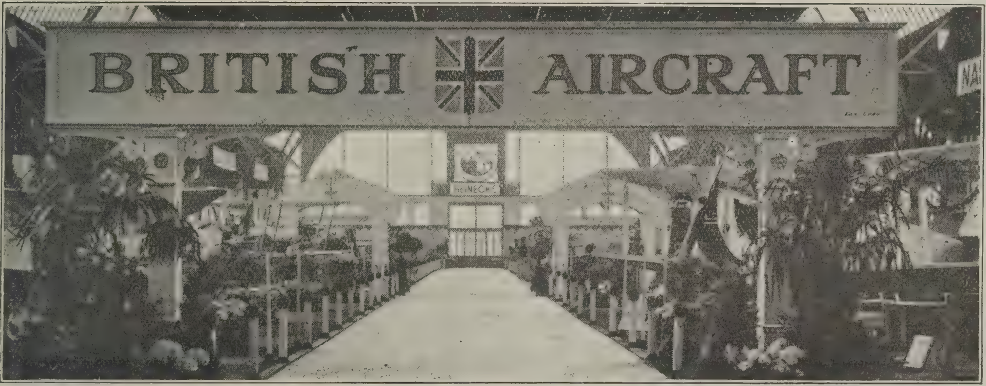

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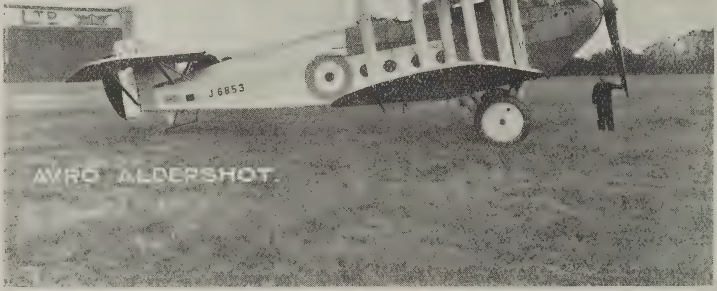

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Aeronautical Engineering

VOL. XXVI. No. 26.

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ON THIRTEEN YEARS OF "THE AEROPLANE."

With this issue THE AEROPLANE ends its 26th half-yearly Volume: that is to say it completes its 13th year and enters its 14th. The first issue of this paper appeared on June 9, 1911, but the four June numbers were included in the volume which was completed at the end of December and since then the volumes have been limited according to the Calendar.

Thirteen is generally supposed to be an unlucky number: but the 13th year of THE AEROPLANE cannot be considered unlucky, for it has seen the turn of the tide of Aviation. During that year from the middle of 1923 to the middle of 1924 there has been a very distinct improvement in aeronautical affairs. In the previous year the Royal Air Force was officially recognised as our First Line of Defence and from then onwards everything has been moving upwards.

To make the R.A.F. capable of upholding this great responsibility the Air Council has during this 13th year created the Home Defence Area and has brought that distinguished officer Sir John Salmond home from Iraq to organise and command it. To make the R.A.F. capable of its still greater task, that of being the First Striking Force at sea or on land, Sir Hugh Trenchard, at once the inspiration and the driving power of the Air Force, has fought that great battle with the Admiralty which has resulted in a victory (or perhaps one should say an agreement) which establishes the R.A.F. as an independent force which shall supply the Air Arm to the Fleet and to the Army while retaining the freedom of its own strategy and tactics in operations which call only for action in the air.

As the result of this recognition of the importance of the R.A.F. the 13th Year of THE AEROPLANE has also seen a Conservative and then a Labour Parliament vote without noticeable opposition for a vast increase in the size and strength of the Royal Air Force. And these votes have been followed necessarily by a considerable increase in the quantities of aircraft, engines and accessories ordered from the British Aircraft Industry. Thus the people who matter most in Aviation, namely the R.A.F. and the Trade, have been made as nearly contented as constitutionally discontented Englishmen can be.

Besides that there have been notable movements in Civil Aviation. It is true that a silly dispute between Imperial Airways and a few pilots held up passenger traffic a few months ago; but even that dispute has done good for it has led to the disclosure of a few home truths about pilots and airways which might otherwise have been hidden for quite a while. Also this 13th Year has produced in the three-engined machine and the flap-winged machine the first serious step towards reasonably safe and reliable passenger-carrying aeroplanes.

Furthermore this 13th Year has seen the revival of the airships—or at any rate the promise of the revival. It is true that one cannot see any direct military value in airships against any nation possessing air force, but in time of peace they can certainly be of much use for mail and goods and passenger transport and they may continue such work with even better effect in time of war when time is worth more than money. Commander Burney, the Protagonist of airships, sees in them high value for the transport of politicians of one part of the Empire to interviews with those of another part. On the principle of the greater containing the less, the gas-bag vehicle may in sooth do good work thus.

Even to THE AEROPLANE itself its 13th Year has not been unkind. It has had a small but steady increase in the quantity of its advertisements and so it has been able to afford a small increase in the number of its pages of reading matter. Those who are responsible for the production of this paper have no hope or intention of making a profit out of it for some years to come. Their first idea is to give British Aviation an aeronautical paper worthy of the Royal Air Force and of the British Aircraft Industry. That can only be done by an increase in revenue, and that revenue can only come from advertisements: for each individual copy sold is a loss.

Enough material is available week by week to fill with ease twice as many pages of reading matter as appear in THE AEROPLANE and the editorial task is not to find stuff to put into the paper but how to decide what to leave out of it. When the Trade is so flourishing as to be able to support a paper as the automobile papers are supported then one will produce an English aviation paper more voluminous and more beautiful than the aviation papers produced in France and America while retaining those characteristics which have given THE AEROPLANE its own particular place in the scheme of things.

For one thing especially THE AEROPLANE can be grateful to its 13th Year. That is the increase in its influence in all quarters. The daily correspondence of this office shows that in the Services, among politicians, among technical people, in our Overseas Dominions, in foreign embassies and legations, in the Government departments of foreign nations and even among people who are not professionally interested in flying THE AEROPLANE is read with an intensity which is on occasion embarrasing to the editorial staff, who are called to account by critical or irate correspondents for every slip which is ever made in the paper. But our compensation is that contrariwise our published criticisms act as an equally healthy irritant on our readers and definitely produce desired results.

Thus one can enter the 14th year of THE AEROPLANE without anxiety. Somehow the progress of the paper reminds one of that affair of Leah and Rachel and Jacob who was called Israel. Jacob, if you remember, served seven years for Rachel and at the end of the time Laban planted Leah on him instead, so that Jacob had to serve yet another seven years for Rachel.

Similarly from 1911 to 1918 one slaved for the good of Aviation and the success of THE AEROPLANE only to have the slump of 1919-20-21 planted upon one as a reward. Still, one humped one's pack again, and with the help of a loyal and keen and very able staff one has struggled through another six years. With W. H. Sayers as Technical Editor, Leonard Bridgman as artist and now as technical writer, Geoffrey Dorman as general factotum and irritant, and the Mesdames Housley, McAlery and Swancott in the Secretarial Department the work of running this paper has been a joy in spite of the hard work which has been necessary. To them one tenders public thanks, not only for oneself but for one's readers.

It now remains to be seen whether the 14th year is going to see the acquisition of the aeronautical Rachel so to speak. Jacob apparently got little good by Rachel for some time after he had paid for her by his seven years of labour. But in the end Joseph arrived, who was worth all the rest put together in spite of his affection for the bizarre in clothing. He, at any rate, made Egypt what it was, and his descendants were the pick of the Israelitish tribes and were probably directly responsible for the foundation of England and of Anglo-Saxon America.

So perhaps we may not see our direct reward even at the end of the 14th Year. Still it has all been very well worth while and one hopes for yet another 14 to follow before one retires to well-earned oblivion. For there will still be much to do.—C. G. G.

ON THE PAGEANT.

Although Their Majesties the King and Queen are unable to be present this year the Royal Family will be represented at the Royal Air Force Pageant by the Duke of Connaught and the Duke of York who is patron of the Pageant. It is hoped that the Duchess of York will also be present.

This, the Fifth Pageant staged by the Royal Air Force, will take place at Hendon Aerodrome on Saturday next. The gates will open at 11.00 hrs. and preliminary heats of the races will start at midday. The Pageant proper begins at 15.00 hrs. There are only nine events this year, which is considerably less than usual. The set piece will be a display by the Coastal Area in which the personnel of the R.A.F. bases at Gosport and Leuchars will play the leading rôles. There will be an attack on a Bohemian commerce destroyer named the *Schleswig* by a flight of Blackburn

DO NOT FORGET THE R.A.F. PAGEANT ON JUNE 28.

(Napier) torpedo-carriers supported by a flight of Fairey Flycatchers (Armstrong-Siddeley Jaguar). The *Schleswig* has been discovered by a Supermarine Seagull (Napier) raiding a British tramp named the *John Henry* and the *Schleswig* is thereupon found, fought, and finally finished by the Flycatchers and despatched by the Blackburns. One suggests to Flt. Lt. Amers that a suitable tune to accompany this spectacle would be "Don't let them scrap the British Navy."

Another new item will be a competition for picking up messages in which No. 2 (Army Co-operation) Squadron, (Manston) No. 4 (Army Co-operation) Squadron (Farnborough) No. 13 (Army Co-operation) Squadron (Kenley) and the School of Army Co-operation will participate.

Then there will be the usual Standard Avro and relay races and the troupe of performing Snipe. No. 25 Squadron will attack a dummy tank with Snipe and there will be a fly past of new and experimental types. Some will be new, but most were in the experimental stage a year or so ago.

Of the new types that will be seen there will be a Bristol Bullfinch with a Bristol Jupiter engine, a Handley Page Hyderabad with two Napier Lions, a Vickers Virginia with two Napier Lions, a Hawker Woodcock with a Bristol Jupiter, a De Havilland Dormouse with Armstrong-Siddeley Jaguar, a Gloucestershire Grebe II with Armstrong-Siddeley Jaguar, a Vickers Venture with a Napier Lion, an Avro Andover with Rolls-Royce Condor, a Boulton and Paul Bugle with two Bristol Jupiters, a Parnall Possum triplane with one central Napier Lion driving two airscrews, a Handley Page W.8F. with one central Rolls-Royce Eagle and two Siddeley Pumas, and the D.H.53 light aeroplane with Blackburne Tom-Tit. The Blackburne Tom-Tit is the Blackburne 698 c.c. motor-cycle engine, after the Air Ministry technical officials have done with it, or in the vernacular "done it in."

There will be a display lasting twenty minutes by an escadrille of the second French fighting regiment under Commandant Gastin. His officers will be Lieuts. Robert, Dutruel, Gaillard and Pascaud, the latter replacing Lieut. Volmerange who is indisposed.

There will be Wing flying drill by Nos. 39 and 207 Squadrons mounted on D.H.9as.

The last item on the programme, which is the Naval Scena, is staged to go off at 17.35 so that the complete Pageant should be over by six o'clock at the very latest.

Tickets for the Pageant, price 5s. and 10s. including Tax can be obtained from all the usual agents, and boxes for six at £4, £5 and £7 can be booked only at Alfred Hays, 26, Old Bond Street, and 74, Cornhill, and there will also be a 2s. enclosure which cannot be booked in advance. The charge for cars is 5s. which admits the car and liveried chauffeur to the 10s. and 5s. enclosures.

There will be a large and distinguished company representing the Services and others already interested or being interested for the first time in flying.

The Government will also be represented. The Prime Minister has accepted the Air Council's invitation to be present and other guests will be Mr. J. H. Thomas and Mr. C. P. Trevelyan. A large number of Members of Parliament have actually applied for tickets and so far just under half the House is likely to be present and a separate enclosure has been reserved for them. Each party is to be strongly represented, and it is to be hoped that the educative intention of the Pageant will be fulfilled.—G. D.

Why Are Airships?

The current issue of *The Saturday Review* dated June 21 includes quite an interesting article by Lieut.-Commander C. Dennis Burney, C.M.G., R.N., M.P., entitled "What is the use of an Airship?" Probably the ribald concerned with aviation would reply "Damned little," but Mr. Burney makes a very good case for his pet vehicle and one recommends readers of this paper to read the article. His chief claim for the airship is that it can fly at night, which the aeroplane can not, and that it can do longer stages without refuelling and that a voyage in an airship does not involve so much strain on the passengers and pilot as does a voyage of equal length in an aeroplane.

For this reason apparently he considers airships more suitable for the transport of political and official personages than is the aeroplane and consequently he regards the airship as being a great potential asset in linking up the Empire. One would like to controvert some of his views but it is just as well that the case for the airship should be known to those who are prejudiced in favour of the aeroplane.

Helicopters.

It is rumoured that the Brennan helicopter which has been constructed at much Government expense and secrecy is to be tested in the open at Farnborough this week. It has been cut several times in the early morning for engine tests.

Those who doubt the practicability of the helicopter should make a study of the common stag beetle which can perform the helicoptic feat and also fly horizontally with amazing skill even though very heavily loaded.

The performances of M. Œmichen in France have made most people (excepting of course the Editor of THE AEROPLANE) believe that the helicopter may in time evolve from a joke to a practical proposition.—G. D.

The Inquiring Mind.

The following intelligent conversation in the House of Commons on June 19 is given in full:—

SIR H. BRITTAIN asked the UNDER-SECRETARY OF STATE FOR AIR the number of aeroplanes which will take part in the forthcoming Aerial Pageant; and whether new features are to be incorporated in it?

MR. LEACH: The answer to the first part of the question is, approximately, 170 aeroplanes; to the second, that new features will comprise:

Flying display by aeroplanes from No. 2 Air Regiment of the French Military Air Service.

Competition in picking up messages from the ground.

Wing flying drill (two squadrons). This is the largest formation hitherto engaged at the pageant.

Air attack on a commerce destroyer by a flight of torpedo aeroplanes, supported by a flight of fighting aircraft.

SIR H. BRITTAIN: Are arrangements being made to give overseas visitors now in England an opportunity of seeing this pageant?

MR. LEACH: Yes, we are affording facilities for that purpose.

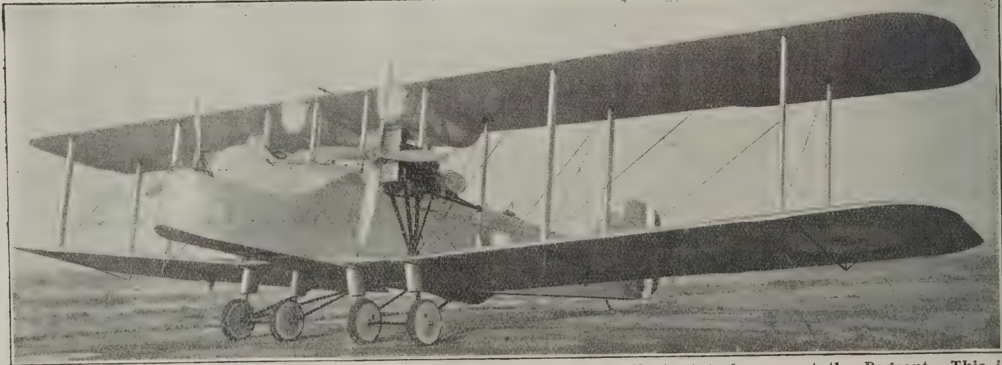
MR. P. HARRIS: What is the purpose of this pageant? Is it for amusement, is it to raise money, or is it for a strategic purpose, or a manœuvring purpose?

MR. LEACH: A combination of the lot.

MR. HARDIE: At this special display will the public be entertained by the evolutions of the helicopter, which, we understand, is now capable of leaving the ground?

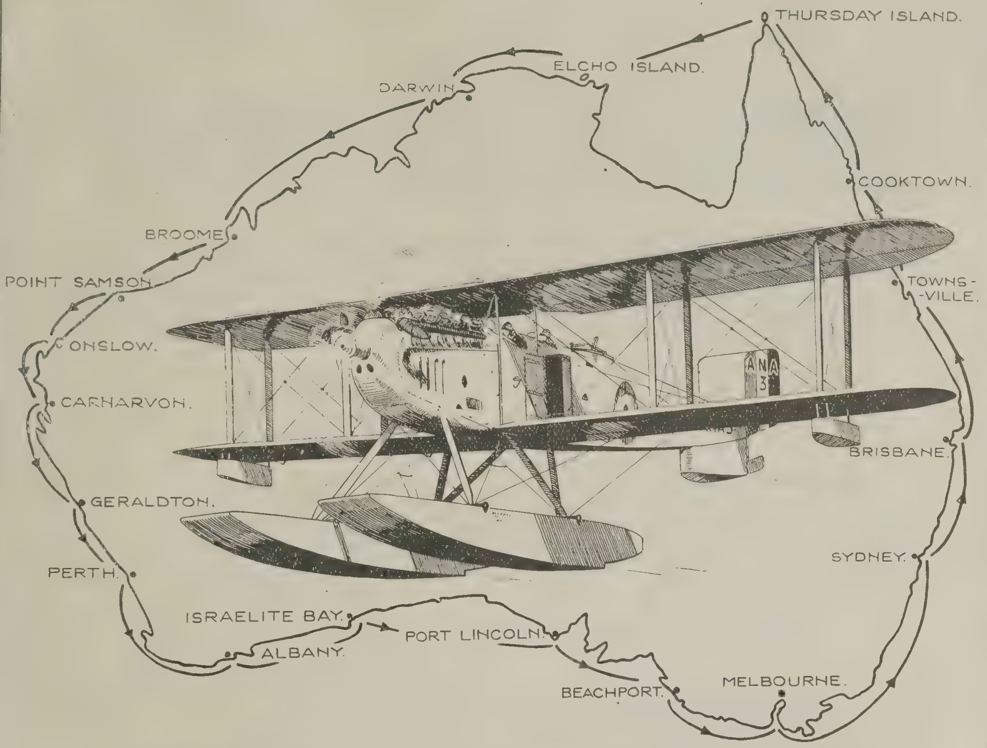
SIR F. HALL: As this pageant is for a combination of all the purposes mentioned, who is going to get the financial benefits derived from it?

[N.B.—They might also have asked:—"What is the Royal Air Force?" "Who is Sir Hugh Trenchard?" "When does an aero plane?" And a few other similarly intelligent questions.—ED.]



A SHEEP IN WOLF'S CLOTHING.—The Handley Page Hyderabad (two Napiers) to be seen at the Pageant. This is the old 1919 type W.8 commercial machine turned into a bomber. A squadron of these machines is to be formed under Squadron Leader Walter Longton.

DO NOT FORGET THE R.A.F. PAGEANT ON JUNE 28.



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This machine can also be fitted with Bristol Jupiter Engine.

PERHAPS the most sensational achievement during the past month in the realm of applied science has been the aeroplane speed created by the winner of the Aerial Derby on August 6th. Constructed by the Gloucestershire Aircraft Company, and piloted by Mr. Larry Carter, the machine completed the Two-Hundred mile course round London in 1 hour, 2 minutes, 23 seconds, thus maintaining an average speed of 192.4 miles per hour. When it is remembered that the course included several sharp turns (at Brooklands, Hertford, West Thurrock and Croydon), each serving to diminish speed very appreciably, it is evident that the average rate must have been considerably exceeded during the greater part of the flight. Actually, Mr. Carter crossed the line at the stupendous speed of 220 miles per hour—proving undeniably the progress achieved in British aircraft design.

"*Conquest*," *Sept.* 1923.

SUNNINGEND
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ENGLAND

THE ROYAL AIR FORCE.

The London Gazette.

June 17.

General Duties Branch.—The follg. Flg. Offs. are granted the honorary rank of Flt. Lt. (May 15):—H. R. B. Howell and F. P. Smythies. Plt. Off. E. C. Roark is promoted to the rank of Flg. Off. (June 3) (substituted for the notification in *Gazette,* June 3, 1923). The follg Plt. Offs. on probation are confirmed in rank (Mar. 15):—

Stores Branch.—Flg. Off. F. M Gingold is transferred to the Accountant List (May 3); Flt. Lt. J. S. Browne, A.F.C., is transferred to the Stores Branch on probation from the General Duties Branch, May 28; Sq. Ldr. E. Rivers-Smith, M.B.E., is transferred to the Reserve, Class C (June 17).

Medical Branch.—F. F. Anslow (temp. Lt. Dental Surgeon, General List, Army) is granted a temp. commn. as a Flg. Off. on attachment to the R.A.F. (May 28); Sq Ldr. H B. Porteous, M.B., ceases to be secd. for duty with the South African Air Force (June 3).

Reserve of Air Force Officers.—The follg Officers are confirmed in rank, with effect from the dates indicated:—Flg. Offs.—C. D. Barnard (Jan 17); C E. V. Graham, M.C. (Feb. 2); A. E. H. Roberts (May 15); C. G. Jenyns (May 16); C. E. Jessel (May 18); E. C. H. Clarke, J. W. Richards (May 23); J. F. A. Baker, C. D. Jennery (May 27); G. P. Olley, M.M. (June 4); L. D. G. Morrison, J. S. C. Robinson (June 11). Plt. Offs.—H. Preston (May 18); H. B. Hampson (May 23); D. C. Evemy (May 27).

Appointments.

Week ending June 16.

General Duties Branch.—Squadron Leader E. D. Atkinson, D.F.C., A.F.C., to No. 1 Sqdn., Iraq, 25/5.

Flight Lieutenants J. A. Slater, M.C., D.F.C., to No. 1 Sqdn., Iraq, 26/5; F. St. J. Woolard, A.F.C., to remain at H.Q., Palestine, instead of to No. 216 Sqdn., as previously notified; R. A. George, M.C., to R.A.F. Depot on transfer to Home Estab., 24/5; W. C. Day, M.C., to No. 84 Sqdn., Iraq, 14/5; E. W. Broadberry, M.C., to No. 4 F.T.S., Egypt, 1/7; C. E. V. Porter and G. I. Thomson, D.F.C., to No. 1 F.T.S., Netheravon, 9/6; E. R. B. Playford, to H.Q., India, 19/3; D. V. Carnegie, A.F.C., to Marine Aircraft Estab., Felixstowe, 12/6.

Flying Officers D. H. Carey, to Arm. and Gunnery School, Eastchurch, 16/6; O. K. Stirling Webb and E. V. Major, to No. 99 Sqdn., Birchame Newton, 11/6; L. H. W. Axtell, to R.A.F. Depot, 11/6; B W. Dudley, M.M., to No. 111 Sqdn., Duxford, 11/6; W. B. O. Fox, to No. 11 Sqdn., Netheravon, 11/6; H. A. Mullaly, to No. 41 Sqdn., Northolt, 11/6; F. L. Woledge, to No. 12 Sqdn., Andover, 11/6; S. T. B. Cripps, D.F.C., to No. 17 Sqdn., Hawkinge, 9/6; C. D. Spiers and F R. D. Swain, to No. 11 Sqdn., Netheravon, 9/6; D. D'A. A. Greig, D.F.C., and A. F. Scroggs, to C.F.S., Upavon, 9/6; A. C. Lamb, to No. 3 Sqdn., Upavon, 9/6; H. Butline, to No. 111 Sqdn., Duxford, 9/6; A E. Golds and E. B. Forster, to No. 24 Sqdn., Kenley, 9/6; E. Marler, to No. 1 F.T.S., Netheravon, 9/6; O. B. Swain, to No. 99 Sqdn., Bircham Newton, 9/6; R. V. M. Odbert, to No. 58 Sqdn., Worthy Down, 9/6; E. N. D. Worsley, to R.A.F. Depot, on transfer to Home Estab., 26/5; F. H. Bedford, M.C., M.M., to Basrah Group H.Q., 1/6; G Anderson, to No. 15 Sqdn., Martlesham Heath, 14/7; J. C. E. A. Johnson, to No. 24 Sqdn., Kenley, 14/7; P. I. V. Rippon, to No. 58 Sqdn., Worthy Down, 14/7; A. W. Bates, C. W. Croxford, D.S.C., and R. S. T. Fleming, to R.A.F. Base, Leuchars, 14/7; H. M. Burrows, to No. 19 Sqdn., Duxford, 14/7; G. A Cavis-Brown, to R.A.F. Base, Gosport, 14/7; K C. Garvie, to No. 29 Sqdn., 14/7.

Pilot Officers A. D. Baillie and D. E. Godwin, to No. 17 Sqdn., Hawkinge, 14/7; J. W. Colquhoun and H. D. Mitchelmore, to No. 3 Sqdn., Upavon, 14/7; H. S Dawe, to No. 29 Sqdn., Duxford, 14/7; F. G. Jennings, to No. 19 Sqdn., Duxford, 14/7; A. G. Moon, to No. 111 Sqdn., Duxford, 14/7; A. R. Perry and A. C. Addams, to No. 41 Sqdn., Northolt, 14/7; G. H. W. Selby-Lowndes and H. M. S. Wright, to R.A.F Base, Leuchars, 14/7; A H Grace, to No. 99 Sqdn., Bircham Newton, 12/6; J. A. Bramley, M. M. Miln and C. G. C. Sullivan, to No 58 Sqdn., Worthy Down, 11/6; J. H. Caulfield, C F. Caunter, C. H. A. Denny and P. Stainer, to No. 111 Sqdn., Duxford, 11/6; E. R. H. Coombes, T. A. Hale-Munro, A. C. Mason and H. St. George-Taylor, to No. 41 Sqdn., Northolt, 11/6; D. J. Dorey, W. J. Pearson, P. Slocombe, C. U. Tristram, and A. R. Buchanan, to No. 12 Sqdn., Andover, 11/6; H St. E. Dracott, C. V. Fevez, G. D. Hamilton, I. B. Pigott, J. A. Wall, to No. 11 Sqdn., Netheravon, 11/6; J C. Hill, V. A. C. Ross, E V. H. Jarvis, to No. 17 Sqdn., Hawkinge, 11/6; St. J. F. Wintour, to No. 99 Sqdn., Bircham Newton, 11/6; L. M. T. Marescaux, to No 24 Sqdn., Kenley, 11/6; B. W. Hemsley, to R.A.F. Depot, 11/6; I. B. Gray, H. C. Evans and E. A. C. Bushell, to No. 9 Sqdn., Manston, 11/6; P. G. Chichester and E. C. A. Wing, to No. 9 Sqdn., Manston, 14/7; D. E. Gain, to No. 99 Sqdn., Bircham Newton, 14/7, H. L. R. Gough, J. A. Mollison, C. R. Troup and H. N. Davies, to No. 24 Sqdn., Kenley, 14/7; C. Mackenzie-Richards and T. R. Wheatley, to No. 15 Sqdn., Martlesham Heath, 14/7, G. Terrell, to No. 70 Sqdn., Iraq, 14/5.

Medical Branch.—Squadron Leader (Medical) H. B. Porteous, M.B., to R.A.F. Depot, 3/6.

Stores Branch.—Squadron Leader (Stores) B. W. M. Williams, to H.Q., Iraq, 22/4. Flight Lieutenant (Stores) H. S. F. T. Jerrard, to Supply Depot, Palestine, 22/5; Flying Officer (Stores) J. Lundon, to No. 47 Sqdn., Egypt, 18/5. Flying Officer (Accountant) J. J. T. Rose, to Aircraft Depot, Egypt, 16/5.

Week ending June 23.

General Duties Branch.—Group Captain A. L. Godman, C.M.G., D.S.O., to School of Technical Training (Men), Manston, to command, 2/7.

Squadron Leaders R. H. Peck, O.B.E., to No. 84 Sqdn., Iraq, 10/5; A. N. Gallehawk, A.F.C., to No. 14 Sqdn., Palestine, 6/6; A. C. Wright, A.F.C., to R.A.F. Base, Calshot, 4/6.

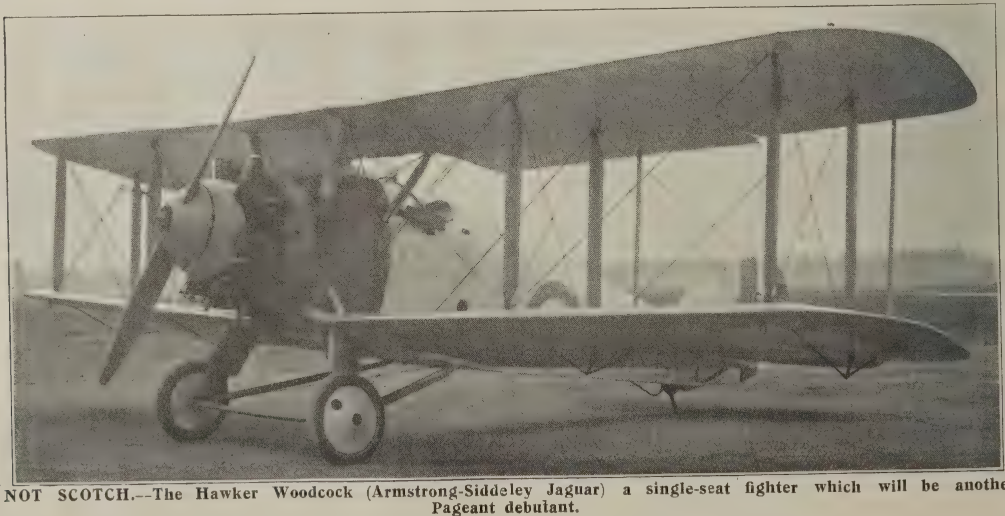
Flight Lieutenants D. H. Dabbs, to R.A.F. Depot (Non-effective Pool), 6/6; H. W. Woollett, D.S.O., M.C., to No. 208 Sqdn., Egypt, 5/6; A. F. Quinlan, to No. 13 Sqdn., Andover, 27/6; F. L. B. Hebbert, to R.A.F. Depot, on transfer to Home Estab., 24/5.

Flying Officers A. C. Heaven, M.C, to No. 13 Sqdn., Andover, 6/6; J W. Turton Jones, to R.A.F. Base, Leuchars, 2/6; H. L. Beatty, to H.M.S. "Argus," 6/5; J. W. C. Harcourt-Vernon, to No. 13 Sqdn., Andover, 2/6; E. L. W. H. Alms, to No. 13 Sqdn., Andover, 5/6; M J. DuCray, to Armament and Gunnery School, Eastchurch, 16/6; E A. Hodgson, to Aden Flight, 3/6; E. C. Roark, to No. 55 Sqdn., Iraq, 21/5; G. C. B. Bernard-Smith, to No. 13 Sqdn., Andover, 23/6; G. Rose, to No. 7 Sqdn., Bircham Newton, 14/6; F G. A. Robinson and M K. McGregor, to School of Photography, S Farnborough, 3/6; M. W. Nolan, to Record Office, Ruislip, 16/6; R A. Whyte, to R.A.F. Depot, 10/6; C. V. Lock and S. Wallingford, to R.A.F. Depot on appointment to S.S. Commns., 19/6.

Pilot Officers A G. S. Tuke, to No. 13 Sqdn., Andover, 25/6; B. W. Hemsley, to School of Balloon Training, Larkhill, 16/6; H. I. Cozens, to No. 56 Sqdn., Biggin Hill, 18/6; R. T. Taaffe, to No. 32 Sqdn., Kenley, 18/6; N. J. Wiltshire, to No. 29 Sqdn., Duxford, 18/6.

Medical Branch.—Flight Lieutenants (Medical) G. H. H. Maxwell, M.B., to No. 208 Sqdn., Egypt, 23/5; J. J. Walsh, to No. 47 Sqdn., Egypt, 20/5; E. G. Howell, to Stores Dept., Egypt. Flight Lieutenant (Dental) J. Wren, to No. 5 F.T.S., Shotwick, 24/6. Flying Officer (Medical) R. T. F. Grace, M.B., to R.A.F. Depot, 16/6; S. S. Proctor, M.B., to Research Laboratory and M.O.S. of I., Hampstead, on appointment to a S.S. Commn., 17/6; J. G. Russell, M.B., B.A., to Station Commandant, Iraq, 17/5; T. V. O'Brien, M.B., to No. 4 F.T.S., Egypt, 21/5.

Stores Branch.—Flying Officer (Accountant) C. P. Puckridge, to No. 58 Sqdn., Worthy Down, 1/7. Flying Officers (Stores) E. P. Terry, to C. & M. Party, Donibristle, 4/6; R. D. G. Macrostie, M.E.E., to No. 29 Sqdn., Duxford, 23/6; C. J. Elliott, to No. 2 F.T.S., Duxford, 23/6. Pilot Officers (Accountants) W. F. Barrell, to No. 13 Sqdn., Andover, 23/6; D. F. A. Clarke, to No. 99 Sqdn, Bircham Newton, 23/6; J. M. Hopkins, to No. 56 Sqdn., Biggin Hill, 23/6; G. R Keep, to School of Photography, S. Farnborough, 23/6; S. C. Wyatt, to Electrical and Wireless School, Flowerdown, 23/6.



NOT SCOTCH.—The Hawker Woodcock (Armstrong-Siddeley Jaguar) a single-seat fighter which will be another Pageant debutant.

DO NOT FORGET THE R.A.F. PAGEANT ON JUNE 28.

Sir W.G.
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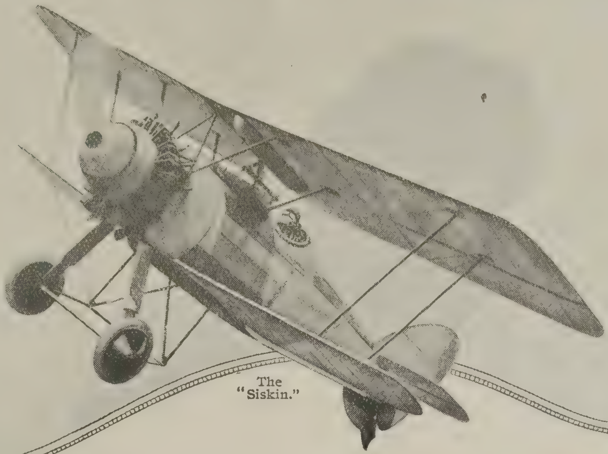

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Permanent Commissions in the R.A.F.

The Air Ministry announces a new scheme of examination for entry into the R.A.F. Cadet College has been approved by the Air Ministry and will come into force next June. The scheme is specially designed to allow boys of suitable character and ability to enter the Cadet College without special tuition.

The examination will also include an interview which will carry marks and will test the suitability of candidates in respect of intellectual outlook and general character to hold commissions in the R.A.F.

The Air Ministry hope that this new and more elastic scheme of examination will throw the R.A.F. open as a permanent career for boys attending public and secondary schools far more widely than has hitherto been the case. The age limits for examination will remain as at present, namely, 17½ to 19 years.

The scheme of examination will be as follows:—Candidates will be required to take in Part I of the examination, English, General Knowledge, Interview and Record and one of the following:—Modern Language, General History, Elementary Mathematics, Everyday Science. In Part II not more than three of the following subjects may be taken, namely, Latin, Greek, French, German, Modern History, Lower Mathematics, Higher Mathematics, Physics, Chemistry, Biology. Candidates taking French or German in Part II may not take a modern language in Part I; those taking Physics, Chemistry or Biology may not take Everyday Science; those taking Lower or Higher Mathematics may not take Elementary Mathematics; those taking Modern History may not take General History. Candidates must obtain a minimum mark in Interview and Record and a sufficient aggregate on the whole examination to satisfy the Civil Service Commissioners.

The first examination under the new regulations will be held in June, 1925, and full details of the new syllabus are obtainable on application to the Secretary, Civil Service Commission, W.1.

The North West Frontier of India.

The *Times* correspondent writing from Simla on June 22 states:—

An interesting example of the way the aeroplane has revolutionised General Staff work is provided by the tour programme of Colonel Saunders, Deputy Director of Military Intelligence, who left here yesterday for Peshawar, whence he will fly to Sara Rogha. He will proceed in a motor-car to Tank and will fly from that place to Dera Ismail Khan. The whole journey from Peshawar will take about six hours. Next day he will fly to Razmak and after a brief halt will fly to Quetta by way of Fort Sandeman.

If the programme holds good, Colonel Saunders will in three days and during the hot weather, accomplish what his predecessors, before the days of the aeroplane, took as many weeks to do. It is the first time a General Staff Officer from Simla has used an aeroplane as a means of conveyance on a frontier tour.

Sara Rogha is about 140 miles south-west of Peshawar. Tank is about 25 miles south-east of Sara Rogha and about 40 north-west of Dera Ismail Khan.

R.A.F. Ground Work.

The following news of the R.A.F. in Iraq is taken from the *Times of Mesopotamia* of June 4:—

Official details of the journey of Sq. Ldr. F. H. W. Guard, C.M.G., D.S.O., Commanding No. 3 Armoured Car Co., R.A.F., from Basrah to Baghdad have arrived here this morning. Our Baghdad correspondent telegraphs: "Military motor convoys from Basrah to Baghdad were by no means uncommon during the days of the great war in Iraq; in fact most of the mechanical transport companies proceeded up country from the Base under their own power, the trek of approximately 450 miles with one hundred vehicles or more usually occupying from a week to ten days. Since 1918 however the Basrah-Baghdad road (with the exception of the Baghdad-Kut end of it) has been very little used and it had become almost impossible for motor traffic owing to the cutting of innumerable irrigation channels by cultivators from both banks of the river to their lands. This obstacle lent particular interest to the experimental journey which has just been completed.

Seven armoured cars under the command of Sq. Ldr. F. H. W. Guard left Basrah on Sunday, May 24, at four o'clock in the afternoon and arrived at Hinaidi at 10 o'clock the following Sunday. It is estimated that they repaired at least 300 bridges en route. Their longest day's drive was from 4 a.m. until 9 p.m. They covered 70 miles in the 17 hours. There were no recognised halting places, the men sleeping in the blue wherever they happened to be at nightfall. The condition of this road nowadays is obviously much worse than it was in war time when some attempt was made to keep it in order and the trip of Sq. Ldr. Guard and his men must be regarded as a highly creditable achievement.

The Heliopolis Murder.

The *Times* of June 20 states:—

The Egyptian Assize Court at Cairo on June 19 concluded the trial of the two Egyptian students accused of murdering Cpl. Ryan, R.A.F., at Heliopolis on Apr. 18. The student who had confessed was sentenced to 15 years' penal servitude, which is the maximum penalty under the Egyptian Penal Code in the case of a person under 17 years of age. His companion was acquitted. This is the first case of political murder to be tried in an Egyptian Court since the abolition of martial law

Lord Thomson and the R.N.V.R.

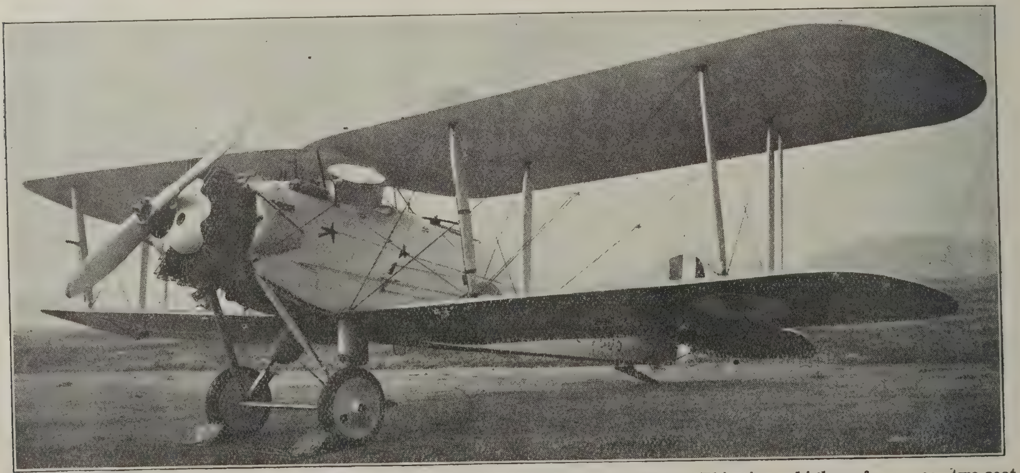
According to the *Daily Telegraph* of June 20, the guest of honour at the monthly dinner of the R.N.V.R. (Auxiliary Patrol) Club held at the Connaught Rooms last night was Brigadier-General Lord Thomson, Secretary of State for Air.

Replying to the toast of "The Guests," Lord Thomson said that everyone interested in the Air Force realised that it was our first line of defence in case of attack. At present we were without rivals in the air, and he looked forward to the time when there would be private owners of "blimps" and aeroplanes in the same way that there were now private owners of yachts, and that everyone would have a glider. The Air Ministry were taking on some of the finest young men of England as pilots and giving them a short service commission for they realised that in all probability the decisive phase of any future war would be in the air, and without a reserve of pilots who would act to the Air Force as the Mercantile Marine did to the Navy, that weapon of defence would be useless.

The King's Cup Race Postponed.

Owing to the fact that the Naval Review takes place on July 26, the King's Cup Race which was to have taken place on that day has been postponed to Tuesday Aug. 12. As both Lee-on-Solent, Calshot and Gosport all of which come into the scheme for the King's Cup Race will be full of Service aircraft and their personnel will be otherwise engaged, it is obvious that the Royal Aero Club have no other course open to them.

A Tuesday is a bad day for many reasons and Aug. 12 would make it inadvisable for the Gloucestershire Aircraft Company to enter the Grouse if they intend to do this.



ALWAYS AWAKE.—The De Havilland Dormouse (Armstrong-Siddeley Jaguar). This is a high-performance two-seat fighter which will appear at the Pageant. It is of typical De Havilland appearance.

DO NOT FORGET THE R.A.F. PAGEANT ON JUNE 28.

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In addition to many Napier engined machines taking part in the Pageant, the following new type Service aircraft will be there :—

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CONTROL WITHOUT OCCUPATION.—II.

[The following is a continuation of the despatch (publication of which was begun last week) from Air Marshal Sir John Salmond concerning operations from Iraq to control hostile tribes in the vicinity.—ED.]

23. Meanwhile, with the High Commissioner's permission, Saiyid Taha, a prominent figure in this part of Kurdistan, was despatched by air to Aqra.

Saiyid Taha had formerly possessed property in the Rowanduz area. He is a man of considerable religious and temporal influence, extending from Shemsdisan (Neri) to Rowanduz, and had acquired considerable prominence as a champion of Kurdish interests against Turkish pretensions.

To him was assigned the rôle of bringing in the leaders of the tribes to the North-East of Aqra and between Aqra and Rowanduz, and thus making it impossible for Euz Demir to create a diversion through them against the Aqra division.

Some 8,000 proclamations, a proportion of which bore his seal, were dropped by aircraft, exhorting the tribes not to hinder the advance of the columns or take part in active hostilities.

Saiyid Taha justified the confidence placed in him. One of the two important Surchi leaders, and the Shaikh of Barzan, came in to Aqra and I was relieved of any anxiety with regard to this quarter. The latter also sent men later in pursuit of the retreating Turks.

24. I at the same time issued instructions for the redisposition of the Units remaining in the Mosul area; and prepared plans for the concentration of all Forces at a point somewhat further South should a serious Turkish attack develop on the Mosul front

The Lines of Communication by which the two Columns would concentrate in this event, and of which no recent information was available, were at once reconnoitred by Armoured Cars. A post was also speedily established by Armoured Cars at the river bridges at Altun Keupri and at the same time a steam ferry was ordered up to the Tigris crossing at the Fathah Gorge.

I was in constant touch by R.A.F. Wireless outstations with the Frontier Posts of Levy and Iraq Army Units; and with this facility, I felt assured throughout the operations that no hostile activity could develop of which I should not have early and ample warning.

25. Koicol left Mosul on 18th March and Frontiercol on 26th. At this juncture supply to the two Columns, always a matter of difficulty in this country of limited and primitive means of communication, was put to a severe test. A most destructive flood damaged the only bridge at Mosul, rendering it for the time being inoperative; carried away the one lorry bearing bridge at Baghdad, converting that City into an island surrounded by many square miles of water; and severed the bridge over the Diyalah at Qaraghan on the main line of Communication between Baghdad and Kirkuk..

The repair of the Mosul Bridge was quickly effected; meanwhile the desert route from Kirkuk Westwards to the Tigris at the Fathah Gorge was recounoitred by Armoured Cars; and that portion of the supply system allotted to the Kingerban-Kirkuk line was diverted, partly to Mosul, and partly to Baiji by rail, and thence across the Tigris at Fathah Gorge and onwards by the desert route to Kirkuk.

The manner in which the Supply Services overcame these difficulties is deserving of the highest praise.

26. By the 4th April Koicol had reached Koi Sanjak; and on the following day Frontiercol had completed concentration at Arbil.

27. At this time (5th April) a letter was received at Arbil addressed to "Commander of Troops Iraq" dated the 3rd April and signed by Euz Demir as "Commandant Rowanduz Group."

The purport of this letter was that he had received a communication from Angora stating that an agreement existed between the British and Turkish Governments whereby each was to remain in possession of occupied territory for one year and to be responsible for its safety. In view of this he asked what our concentration meant and asserted his readiness to fight to the last for the safety of the tribes in his area if a shot were fired. No reply was sent.

28. In order to make clear the interdependence of subsequent operations they are tabulated by date:—

...

	Frontiercol.	
Leave	Arbil	8th
Arrive	Sorak Chai	15th
"	" "	16th
Attack	Spilik	20th
	Khaniwatman	21st
	Rowanduz	22nd
	Koicol.	
At	Koi Sanjak	
	" "	9th
	Serkhuma	10th
Action	Rania	night of 10-11th
	Serkhuma	11th
	"	15th
	"	16th
Arrive	Nunawek	17th
"	Balassan	18th
"	Benawi	19th
	"	20th
	"	21st
"	Rowanduz	22nd

29. On the 9th April, I flew to Koi Sanjak to see the Officer Commanding Koicol and gave instructions for a pack transport column to be collected within 10 days' time sufficient to enable Koicol to proceed to the assistance of Frontiercol should it become necessary. In the meanwhile I approved of his immediate programme, namely, to move from Koi Sanjak to Serkhuma (half-way to Rania), and to carry out during approximately the following 10 days raids against the Rania and Betwata areas.

During that time it would become evident whether or not he would have to divert his column to the assistance of Frontiercol.

30. On the following day Koicol moved to Serkhuma and on the night 10/11th April and on the morning of the 11th carried out a successful operation against Rania and Serkabkhan. The movement was an enveloping one by two Columns; and had the right Column succeeded in reaching its objective by dawn a considerable coup would have resulted. As it was all the missing parts of the two guns lost in August, 1922, by Ranicol were recovered, with the exception of the breech block and dial sight which were afterwards recovered in Rowanduz; and the villages of Serkabkhan, Rania, Boskin and Kurajo were destroyed.

A detailed account of this and subsequent actions of Koicol will be found in the report of Colonel Commandant Vincent which, together with that of Colonel Commandant Dobbin, will be forwarded shortly.

31. Frontiercol meanwhile was approaching Rowanduz and on the 15th had arrived at the Sorak Chai, a stream running through the Harir Plain to the Greater Zab, about half-way between Arbil and Rowanduz. The Column was accompanied throughout by aircraft, which bombed all likely position of enemy resistance, and arrived at this point unscathed, having burnt certain villages en route from which the enemy had fired

32. A quantity of evidence had by this time been received from both air reconnaissance and other intelligence reports showing that the enemy intended to make resistance on the Spilik Dagh, a ridge of hills which forms the Northern boundary of the Harir Plain, and which directly crossed the line of march of the Column to Rowanduz. As indications were to hand that this was the enemy's main position and that, if he were once compelled to relax his hold upon it the tribes which had hitherto backed him would disintegrate, I made on the 15th April a personal reconnaissance by air.

During this flight I was very much impressed with the natural strength of the Spilik position, and, knowing at the same time that the enemy were holding it in force I formed the conclusion that without an enveloping movement it could not be taken without considerable loss.

I decided accordingly that Officer Commanding Frontiercol should delay his attack pending the arrangement, if Line of Communication problems permitted, of an outflanking march by Koicol to the North-West.

33. The following instructions were dropped by aeroplane next morning at Frontiercol Headquarters.

Dropped Message No. 1.

From :—A.O.C. Arbil.
To :—O.C Frontiercol.
Date :—April 15th 22.30 hours.

As will be seen from attached intelligence map a considerable body of enemy is reported to be on right flank of your march from Sorak Chai to Spilik and from Spilik to Khaniwatman. The necessity therefore for the defence of your supply column is emphasised.

I am proceeding Koicol to-morrow 16th instant and will endeavour to arrange the following: In view of the fact that all reports indicate that Euz Demir intends to oppose your Column primarily in the Spilik Dagh the opportunity should not be lost of cutting the enemy off by means of an advance by Koicol towards his rear, arriving at a point between Rowanduz and Spilik Dagh at a time synchonising with your attack on the Spilik. If it is possible to arrange this outflanking march by Koicol Colonel Vincent cannot under any circumstances arrive in the area indicated above before 21st instant. It will, therefore, be necessary for you to delay your attack until that date. Colonel Vincent will be instructed to communicate direct with you in detail on this matter. Should, however, I find that owing to transport difficulties it is impossible to carry out this outflanking manœuvre you will receive code message "Nihil." On receipt of this you will revert to your original plan of operation. If Koicol co-operates messages will be sent "Communicate Koicol."

Under all circumstances you will keep your supply Column holding 21 days' reserve supplies.

Acknowledge.

(Signed) J. M. Salmond,
Air Vice-Marshal,
Air Officer Commanding.

34. On the 16th I flew to Serkhuma to see Colonel Commandant Vincent, having received the satisfactory news from him the previous evening that he had collected sufficient transport. He pointed out the risk entailed to his communication in view of the difficult country, the hostility of the inhabitants and the fact that his supply Columns were composed entirely of hired transport. He was, however, prepared to undertake it; and knowing his personality I felt confident that he would succeed.

Once a junction was effected by Koicol with Frontiercol the latter had a reserve of 21 days' supplies on which he could draw.

35. I accordingly gave him instructions to proceed with the move along the route Nuwaneh (17th April), Balassan (18th April), Benawi (19th April). On reaching Benawi he should be in touch with Frontiercol, and I therefore arranged that on arrival there he should take command of the operations of both Columns.

(To be continued.)

Far-Reaching Fairchilds.

Country nineteen miles square including the City of Dayton, O., was photographed in a single exposure from a height of 31,540 ft. by Lts. Macready and Stevens on May 2. The machine from which these amazing photographs were taken was the famous Le Père on which Lieut. Macready has put up so many altitude records and the camera was a Fairchild Automatic K.3.

Another New Supermarine.

Tests are being made at Southampton this week with the Supermarine "Swan." This is a commercial amphibian driven by two Napier Lion engines and is very similar to the twin-Rolls-Royce amphibian recently illustrated in THE AEROPLANE.

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THE PRAGUE AERO SHOW.

By LEONARD BRIDGMAN.

A general view of the British Exhibit at the Prague Aero Show in the right wing of the exhibition building. On the left the Avro Lynx and a wing-tip of the Siskin, and on the right the Blackburn torpedo-machine.

On May 31 the 3rd Annual Aero Exhibition was opened at Prague by President Masaryk in the presence of a large gathering of notable people, including Lord Thomson, the Air Minister, and Air Vice-Marshal Sir Sefton Brancker, the Director of Civil Aviation, who in company with Mr. Frank Hodges, the Parliamentary Secretary of the Admiralty, had flown from London on the previous day in the D.H.50a piloted by Mr. Hubert Broad, and Sir George Russell Clarke, the British Minister in Prague.

The Aero Exhibition was held in a permanent building of pleasing design situated in some open gardens. Four countries were represented by exhibits of aircraft, engines and accessories—Great Britain, France, Czecho-Slovakia and Germany.

Of the Exhibition as a whole it can safely be said that it was a success. Czecho-Slovakia certainly held pride of place, France, whose interests in Czecho-Slovakia are something more than the mere selling of aircraft, certainly made an imposing show, but Germany and Great Britain fell well below the standard set at Gothenburg last year. That Germany should attach little importance to the Prague Show is understandable, but Great Britain's representation was, on the whole, very poor. One does not mean that the exhibits were poor, but rather that the few British aircraft could hardly be called representative of the British Aircraft Industry.

The poor representation was not the fault of either the S.B.A.C. or the Aircraft Constructors individually. Up to four or five weeks before the opening of the Exhibition no decision had been arrived at by the Treasury as to whether a grant should be made to assist the British Industry. No British Aircraft firm can afford under the present state of affairs to build aircraft solely for Exhibition purposes and as permission from the Air Ministry to show British experimental Service aircraft has been consistently refused, the position of the Industry, when it was informed that a Treasury grant had been made, can be imagined.

Three firms agreed to send aircraft and it was with the utmost difficulty that their machines were despatched post haste to Prague. A. V. Roe and Co. Ltd. sent an Avro 504N fitted with the 180 h.p. Armstrong-Siddeley Lynx engine, Armstrong-Whitworth Aircraft Ltd. a Siskin II with the Siddeley Jaguar engine and the Blackburn Aeroplane and Motor Co. Ltd. a Blackburn torpedo-carrying aeroplane with a 450 h.p. Napier Lion engine.

The British engine exhibit was good. Rolls-Royce, Napier and Armstrong-Siddeley represent the very best in the World's aero engines, and the one engine that was missing to make the British engine exhibit complete, the Bristol, was shown as a French engine by Gnôme et Rhone, by whom it is built under license in France. It was a pity that a British specimen of the Jupiter, together with the Lucifer and the Cherub, could not have been shown on the S.B.A.C. stand, but the fact that it is the only British engine taken up by France and that a French example was shown in the French section surrounded by photographs of notable aircraft fitted with the Jupiter engine, made it distinctive and reflected considerable credit on its parent firm.

One has heard the British S.B.A.C. stand described as a very commendable flower show, but in spite of that what aircraft material was shown certainly attracted considerable interest. Of the engines shown, the Napier Cub (1,000 h.p.), the Napier Lion (450 h.p.), the Rolls-Royce Condor (700 h.p.), the Rolls-Royce Eagle IX (375 h.p.), the Siddeley Jaguar (350 h.p), and the Siddeley Lynx (180 h.p.), little further can be said than has already appeared in the press. Their qualities are known all over the world and their performance in service counts for more than pages of laudatory comment.

Speaking of performance in service brings one back to the question of Government aid to the British Industry for foreign Aircraft Exhibitions. There is no doubt that for the edification of the man in the street a nicely polished aeroplane on a carpeted stand, surrounded by the choicest hot-house plants is interesting and is the subject of much awe and wonderment. In this respect the three British aeroplanes at Prague provoked more than their share of awe. But to convince the aforesaid man in the street that aeroplanes are more than mascots for millionaire's automobiles and, that which is most important, to demonstrate to the various missions and representatives of foreign Governments and other like people with whom business can be done, it is almost essential that all aircraft exhibited at any exhibition should be capable of being transported to the nearest aerodrome immediately after the exhibition closes and demonstrated in the air.

Not one of the three British aeroplanes at Prague could have flown at Kbely aerodrome. As representatives of British training, fighting and torpedo aircraft the Avro, Siskin and Swift probably stand second to none, but owing to the extremely short notice given to the British industry in general these machines were despatched as they were and therefore to have flown them before any foreign representatives, totally untested, would have been folly. In the case of the Avro 504N the machine was despatched on the Monday preceding the opening date and the Lynx engine was only received from the manufacturers on the previous Saturday. And both the other aircraft were in a somewhat similar predicament.

The French Government decided long ago that they would support the Prague Exhibition. One can remember reading a paragraph in the French Press months ago a list of the exhibiting firms. All these firms sent aircraft, some of which are standard French service types, with the sole idea of demonstrating them in the air. On the day of the closing of the show all the French aircraft were hurriedly dismantled and on the following day at least three were flying at Kbely Aerodrome.

Again one noticeable feature of the Exhibition was the large number of French generals and other officers of high rank who were present at the opening ceremony and various banquets and were visible at all times either at the Exhibition or the aerodrome.

At the opening ceremony Great Britain was represented by the Lord Thomson, Air Vice-Marshal Brancker, Mr. Frank Hodges, who, incidentally, was not directly concerned with the Aero Exhibition, but was merely making use of air transport to convey him to some Socialist conference in Vienna and stopped over at Prague to see what there was to

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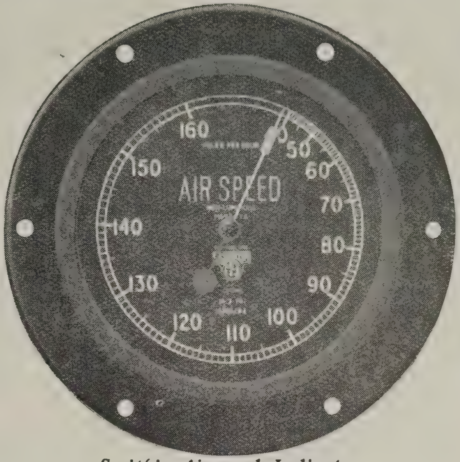

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A view of half the British exhibit showing the Siddeley Siskin and the Avro Lynx together with the Armstrong-Siddeley Jaguar and Lynx engines.

see, the British Minister at Prague and the representatives of the various exhibiting firms. All the French officers were resplendent in their *bleu d'horizon* and medals and they completely dazzled the eye by their splendour.

At the next banquet, Lord Thomson and Air Vice-Marshal Brancker having departed for England and Mr. Hodges having gone on his way to Vienna, the British contingent consisted of the representatives of the exhibiting firms and the secretary of the British Minister at Prague. The French contingent were still in all their splendour. Again at the following banquet, the British Minister having decided that he had done his work, even failed to send his secretary and still the French were in all their splendour. It was a sad exposition of British support.

If the British Industry deserves the financial support of the Government surely something better can be done to impress the foreign nations with British prestige. The Industry cannot do more than to send its best in the time available and it certainly looks to the British Government, its best customer, to back it up.

The Prague Exhibition has certainly opened up a question which requires thrashing out before we decide to exhibit at any further exhibitions. Financial support is essential so long as the Industry is dependent on the Government for its very existence, but the question of practical support is one that must be investigated in order to cope, on an equal footing, with other nations.

One has the example of the Royal Navy, who frequently send warships on "showing the flag" expeditions and who are at the moment expending huge sums on sending the Hood, which is the largest battle cruiser in the World and costs something over half a million in annual upkeep, and a light cruiser squadron round the World. Before the war the results of these "showing the flag" expeditions were reflected in the number of foreign warships built in British dockyards and in the number of Foreign Navies who used the British Navy as a model and even employed British Naval Missions to run their navies.

The cost of sending aircraft squadrons to foreign countries for a few weeks during aircraft exhibitions would be nothing compared with these naval expeditions and there is no doubt as to the results.

The S.B.A.C. one feels sure, feels the same concerning the apparent neglect of the British Government and it is to be hoped that having put up such a poor show at Prague something will be done to stir up a little interest on the part of the Government in a most important question and one which concerns an industry which if given the support will compare favourably with the British shipbuilding industry to the final benefit of the Royal Air Force, and in particular British prestige abroad.

The Exhibits.

The British Aircraft Industry was represented by three aircraft constructing firms and three aero-engine firms. A brief description of the examples of aircraft and aero engines follows hereafter:

The Avro 504N shown by A. V. Roe and Co. Ltd. is a further modification of the type 504 for training and similar purposes. The 504N is fitted with an Armstrong-Siddeley Lynx engine of 180 h.p. and every care has been taken in the installation of this engine and every precaution against fire has been embodied.

The undercarriage which is fitted is of a new and practically unbreakable type which combines oil dashpot damping with rubber discs in compression. The top centre-section of the wings has been cut back to the spars on both leading and trailing edges which greatly improves the view upward from both seats. The petrol tanks are now carried under the surface of the top plane just outside the centre section and the feed is now entirely by gravity and practically foolproof.

An adjustable tail plane is controlled by levers from both cockpits and in order to lighten and harmonise the controls, ailerons of improved shape have been fitted. These taper in chord towards the wing tip.

Otherwise the 504N is of standard Avro design and preserves those features which have gone to make the Avro the finest training machine in the World.

The Blackburn Swift torpedo-carrying aeroplane is well known to everyone and can be classed as one of the most advanced machines of this type. Not only has the machine been designed for torpedo-carrying and dropping but it is also a very compact ship aeroplane. It can be fitted with air bags and the wheels can be removed automatically so as to facilitate alightings in the sea, wings are made to fold for stowage on board ship and its all-round performance, low landing speed, and remarkable quick get-off make it eminently suitable for the purpose for which it was designed.

Examples of the Swift have been purchased by various foreign navies, including U.S.A., Japan and Spain, and one of the machines of the latter order has been fitted with an extra seat for dual control instruction and flying light has been looped, rolled and spun.

The engine is a 450 h.p. Napier Lion and its performance figures are as follows: Max. speed, 106 m.p.h. (171 km.p.h.). Min. speed, 45 m.p.h. (72.5 km.p.h.). Climb at sea level 750 ft. per min (228 m. per min.). Ceiling, 15,000 feet (4,600 m.).

The Armstrong Siskin is a single-seater biplane fighter fitted with the 370 h.p. Armstrong-Siddeley Jaguar engine. The fuselage is of steel tube throughout and is braced with tie-rods. The wings which are of wooden construction vary in chord and span the top plane chord being twice that of the lower plane.

Interplane struts are of steel tube and a system of wing bracing is utilised which renders the machine capable of withstanding much shooting about in actual warfare with very little risk of all the flying wires being shot away. The wings are braced in the normal way between the planes but in addition duplicate flying-wires are used between a pylon under the fuselage, which forms part of the undercarriage but which takes no landing strains, and the lower surface of the bottom plane at a point immediately below the interplane struts.

The undercarriage is of a special oleo-pneumatic type and consists of two legs and an axle which are free to rise against the action of the oleo gear. The axle is hinged by two radius rods, to two Vees placed in rear of the main legs.

The engine is mounted on a pressed steel frame arranged so that it can be withdrawn from the aeroplane without removing the carburettor or any other of its parts.

Armament consists of two fixed Vickers guns mounted just in advance of the pilot's cockpit on either side of the fuselage. The pilot is placed with his eyes in line with the chord of the top plane so that he has an excellent view both above and below the top plane. The chord of the bottom plane is very narrow and offers but little obstruction to the view downwards. The Siddeley Siskin shown at Prague was

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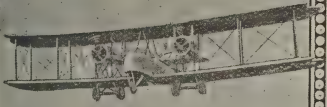

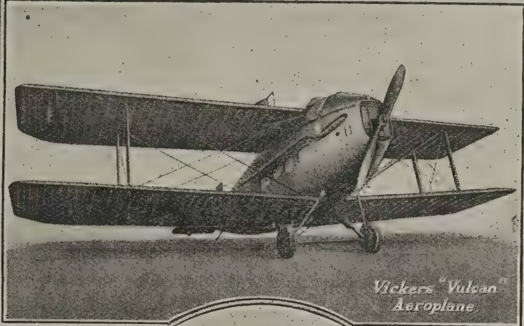

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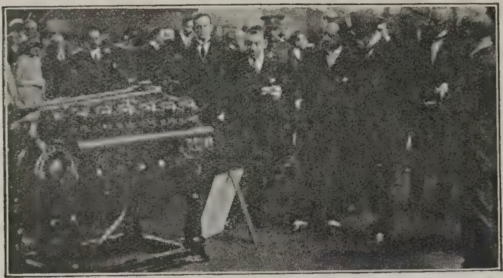


President Masaryk being shown round the British Exhibit by Air Vice-Marshal Sir Sefton Brancker. He is here seen examining the Rolls-Royce Condor III engine.

President Masaryk examining the Napier Cub.

the machine on which Mr. Courtney won the King's Cup Race last year at an average speed of 148 m.p.h.

The British engines shown on the S.B.A.C. stand were the Rolls-Royce Condor III, the Rolls-Royce Eagle IX, the Napier Cub, the Napier Lion, the Armstrong-Siddeley Jaguar and the Armstrong-Siddeley Lynx.

In accessories Henry Hughes and Son and S. Smith and Sons (M.A.) Ltd. showed an interesting range of aircraft instruments, Palmer Tyre Ltd. their well-known aircraft wheels and tyres with which many of the aircraft, British and foreign, in the Show are also fitted, Accles and Pollock specimens of steel-tube work and Cellon Ltd. dopes, varnishes and Cerric finishes.

In addition photographs of all types of British aircraft were arranged on the walls in the vicinity of the stand with one or two pictorial diagrams showing the growth of British Civil Aviation.

The Czecho-Slovak Effort.

Czecho-Slovakia made a brave show at its 3rd International Aero Exhibition. It must be realised that in 1918 Czecho-Slovakia was a portion of Austria-Hungary. On the granting of its independence in 1919 it possessed no aircraft industry or air force whatever. From 1919 to 1924 the growth of its aviation has been phenomenal. Not only has it an efficient Air force, but it constructs its own aeroplanes and aero-engines.

There are three concerns constructing aircraft and three building aero-engines. The Military Aircraft Works which is under Government administration has already built and flown ten different types of aircraft and many new and ambitious designs are under construction or are projected. The Aero Co. or the Aero Tovarna Letadel, to give it its correct name, has built and flown at least ten original designs and Milos Bondy a Spol has produced something like fifteen distinct types of aircraft. One of the latter firm's machines achieved international fame by winning the Belgian Coupe du Roi in 1923 in competition with aircraft of all nations and another machine recently made a Czech duration record by covering 747 miles in 9 hrs. 46 mins. with a 60 h.p. Walter engine, also a Czech design.

The two designers of the last firm, MM. Benes and Hajir, are both graduates of the Prague Technical College and neither had any practical experience in aircraft design prior to 1919. The machines exhibited on their stand, ten in number, show that as designers they have little to learn from abroad.

In aircraft engines the famous Skoda Co. of Plzen build Hispano-Suiza engines under license. Breitfeld and Danek produce four distinct aircraft engines in power ranging from 50 h.p. to 450 h.p. and the Walter Co. build a very intriguing 60 h.p. air-cooled radial engine and also the B.M.W. under license.

The three aircraft firms supply the demands of the Czech Flying Corps and at the end of 1923 there were 260 aeroplanes in service in the Flying Corps, of which 220 were of national design and construction, the remainder being relics of the war some being reconditioned Austrian design aircraft and others some French aircraft supplied at the termination of hostilities before the home constructors had established themselves.

One feature of the Czecho-Slovakian aircraft is the extraordinary good workmanship and superfine finish found on all machines exhibited.

Milos Bondy most certainly creates a record for the Exhibition and incidentally for any Aircraft Exhibition that one can remember seeing or even reading about, by exhibiting ten aircraft on its stand. The Military Aircraft Works shows two aeroplanes and many models, and "Aero" shows five whole and complete aircraft.

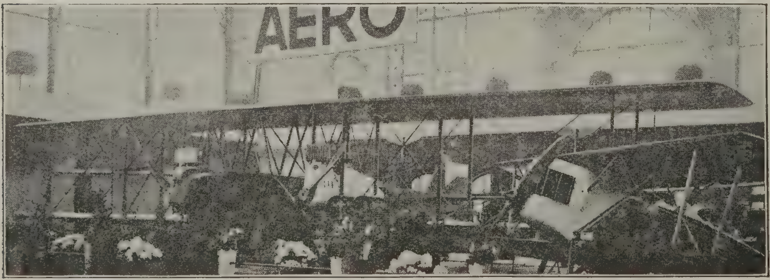
The collective Czech exhibit gives one the impression of prosperity, and throughout good workmanship and finish is very noticeable. The following is a brief description of the three individual exhibits:—

Aero Tovarna Letadel, Prague.—The Aero Co. are showing five machines, all for military purposes. These are the Aero 18, a single-seater scout with a 220 h.p. Walter engine, the Aero 18b the same machine as the 18 but with smaller wings. It was this machine that won the President Masaryk Speed Prize in 1923 and also holds the Czech speed record with 230 km.p.h.

The Aero 12 is a two-seater military reconnaissance biplane fitted with a 260 h.p. Maybach engine, the Aero 20 a single-seater scout with the 300 h.p. Hispano-Suiza engine and the Aero 24 a big two-engined night-bomber with two 260 h.p. Maybach engines.

The Aero firm situated in Prague-Vysocany employs 800 workmen all of whom live up to their name in the literal sense for although one is not permitted to pry into the innards of the Aero machines the exterior finish is *par excellence* and one is therefore led to believe that nothing but the best could be enclosed in such a matchless exterior. Be that as it may a good exhibition finish is a good quality. All the machines are dazzled and bear the Czech military markings.

The Aero 18 is a comparatively old machine having been produced in 1921 and a machine of this type was exhibited at the Ilug, Gothenburg, of glorious memory. It is a small straightforward biplane of wooden construction. The wings are of practically equal span the top plane being carried on a W-type centre section and there are one set of interplane struts on either side of the fuselage. The engine, a 220 h.p. Walter, is well cowled in, the radiators of Aero design being mounted into the side of the cowling. The fuselage tapers to a horizontal knife-edge, the fin and rudder being above



The stand of the Aero Tovarna Letadel showing in the centre the Aero 24, a large twin-engined night bomber of Gotha-ish aspect, and in the right-hand corner the Aero 18 a small single-seat scout fitted with the new 220 h.p. Walter engine. The Aero design radiators let in the side of the cowling can be seen on this machine.

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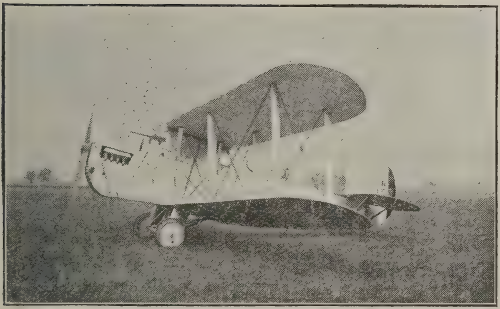

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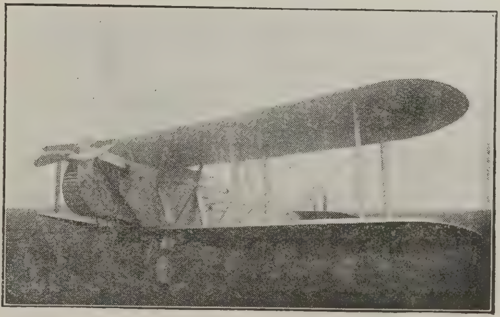

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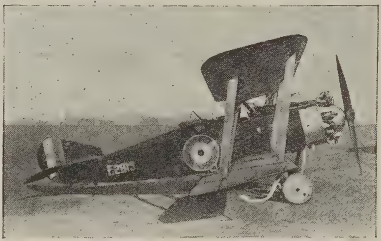
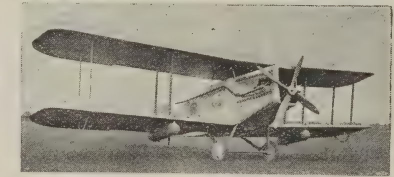
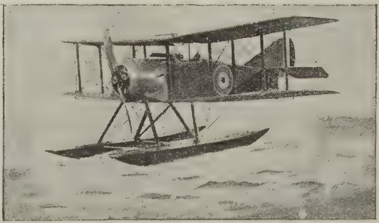


Westland Weasel 2-Seater Fighter.



Westland Hispano Suiza Limousine.



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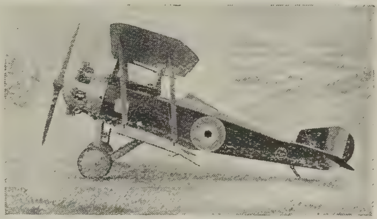
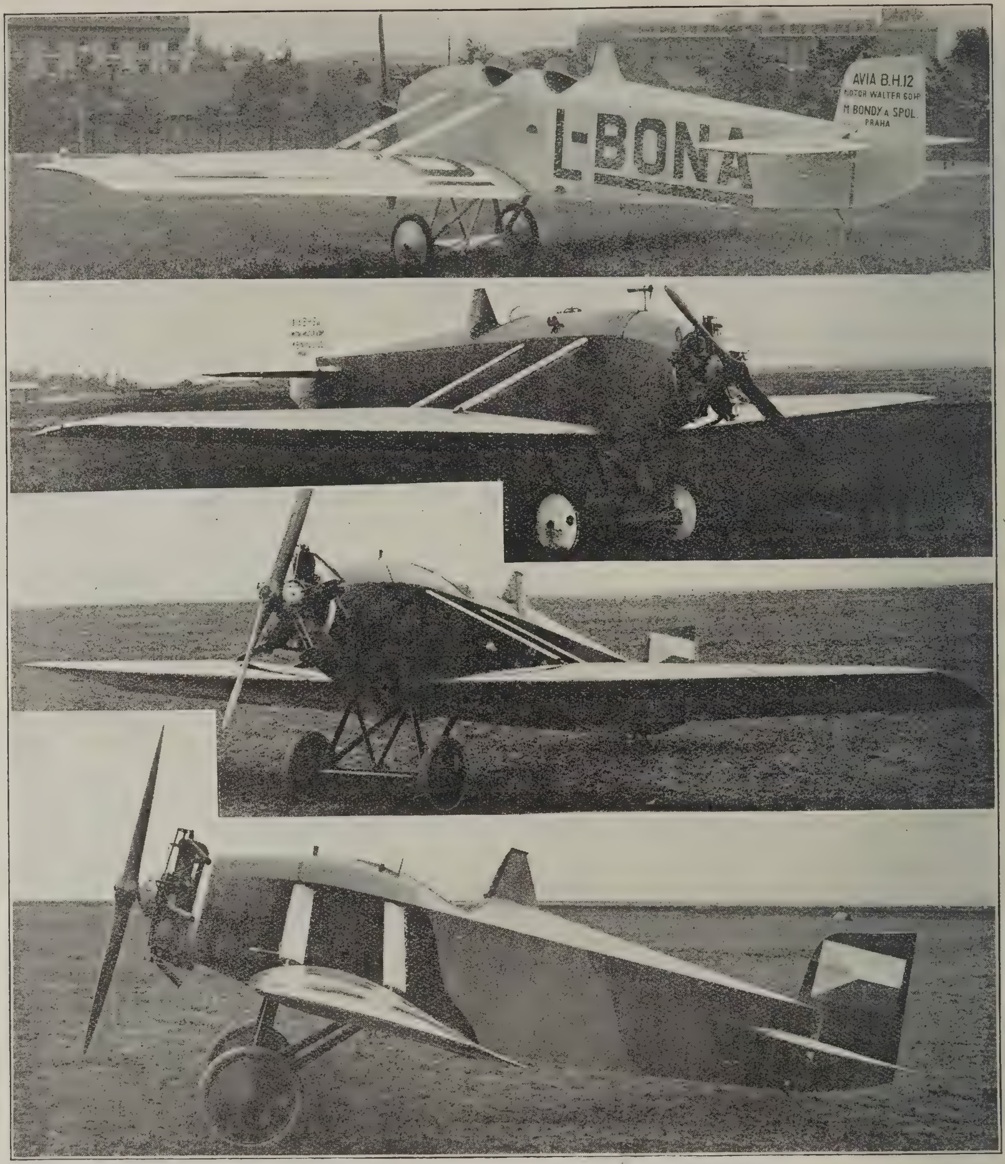


Westland Wagtail Single-Seater Scout.

Westland Napier Limousine.

Westland Rolls Falcon Limousine.



Four of the low-wing Avia Monoplanes. From top to bottom these are the Avia B.H.12 two-seater with folding wings, the Avia B.H.9a which has made a duration flight of 9 hrs. 46 mins., the Avia B.H.9 two-seater training monoplane and the B.H.10 single-seater sporting monoplane. All are fitted with the 60 h.p. Walter radial air-cooled engine.

the fuselage, with divided tail plane and elevator. The 18b is identical except for the smaller set of racing wings fitted for speed work.

The Aero 12 is a two-seater reconnaissance biplane fitted with the 260 h.p. Maybach engine. The general lay-out is similar to the Aero 18. The top plane is mounted on a W centre section and there is one set of struts on either side of the fuselage. Ailerons of the balanced type are fitted to the top plane only. The fuselage is of constant depth throughout, the top longerons being inclined slightly upwards aft of the gunner's cockpit to the vertical knife-edge aft. The engine is completely cowled in, the nose finishing in a spinner. Aero-type radiators are mounted alongside the engine.

The Aero 20 is a single-seater scout with the 300 h.p. Hispano-Suiza engine, this particular type being built under license by the Skoda Co. at Plzen. It is similar to both the types 12 and 18, therefore warrants no further description.

The centre-piece of the Aero stand is a twin-engined night-bomber, Aero 24, fitted with two 260 h.p. Maybach engines. One is given to understand that the machine is very secret, but as it possesses no features of particular interest, such limitation of information matters little. One has heard it likened to the Gotha bomber of 1916-17 and the Vickers Vimy.

Milos Bondy a Spol, Prague.—This stand, the largest in the Show, is made up as follows :—In the centre on pedestals are shown an Avia B.H.5 (70 h.p. Anzani) and an Avia B.H.9 (60 h.p. Walter). On the former machine M. Zdenko Lhota, a Czech amateur pilot, won the King of the Belgians' Prize at Brussels in 1923, and on the latter, the same pilot made a Czech endurance and distance record by covering 747 miles in 9 hrs. 46 mins.

Arranged round the stand are the following machines :—the B.H.9, 10, 11 and 12, all fitted with 60 h.p. Walter engines, two B.H.16s, one fitted with a 16 h.p. four-cylinder horizontally-opposed air-cooled engine, and the other which will be fitted with a Blackburne Tom-Tit engine but is shown

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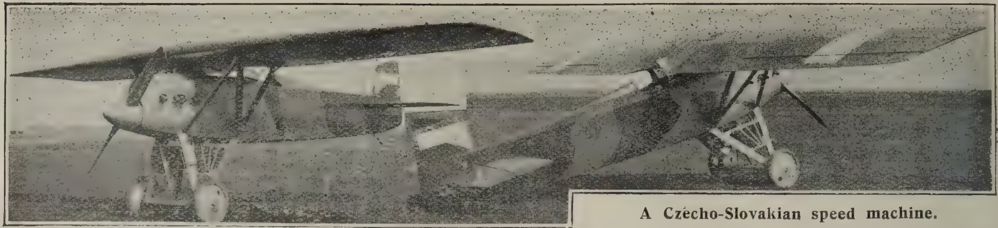


A Czecho-Slovakian speed machine.

The Avia B.H.7 Parasol monoplane (300 h.p. Hispano-Suiza engine). This machine was not at the Prague Exhibition.

minus the engine, two B.H. 17s single-seater biplane fighters, one of which is shown in skeleton form and one B.H.19, a single-seater monoplane fighter these last three all having the 300 h.p. Hispano-Suiza engine.

On the Avia stand more than any other one is impressed with the excellent detail design and workmanship of the Czech aircraft.

With the exception of the B.H.17 all the Avias are of the low-wing type monoplane made known in England in the D.H.53. All are descended from the B.H.1 which made its appearance in 1921 and is claimed to be the very first low-wing monoplane with rigid bracing introduced into practical use.

The Avia B.H.9 is a two-seater monoplane very similar to the B.H.1 and the B.H.5, while the B.H.10 is a single-seater similar to the B.H.9. Both the B.H.9 and B.H.10 are destined for school and training purposes. The B.H.11 corresponding to the B.H.9 but fitted with larger tanks has been produced for the Army for use as messenger aeroplanes, while the B.H.12 is the same type again but fitted with folding wings. Two B.H.12s, one with the 60 h.p. Walter and the other with the 70 h.p. Anzani, are being sent to Brussels to compete in the 1924 Coupe du Roi.

The B.H.16 is again of the same general type as the B.H.9 but of much lighter construction and fitted with either the Vaslin or Blackburne light aeroplane engines.

The B.H.17 is the only Avia biplane shown and was designed to the order of the Czech Army for whom it is being built in series. The Hispano-Suiza is very completely cowled in, the main petrol tanks being situated in the fuselage behind the engine. The water and the oil tanks are carried above the fuselage within an invented V cabane, the whole being cowled in, reminding one strongly of the "Bamel" in appearance. Interplane struts are of the I type and consist of a single strut braced at the upper end to the top rear and at the lower end to the bottom front spars by adjustable rods, these rods being encased in streamline fairing.

The wings are semi-thick and are of all-wood construction, even to ply-wood covering as far back as the rear spar. There is no internal wing bracing. The fuselage is fairly deep. The rudder is hinged direct to the vertical edge there being no fin. The radiators of Avia design are mounted between the undercarriage legs.

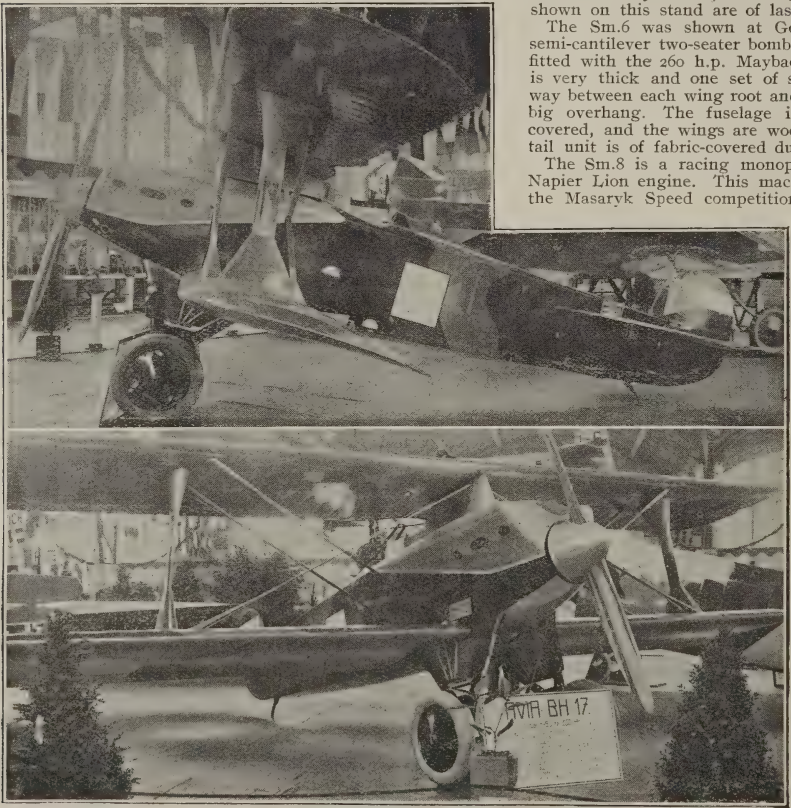
The B.H.19 returns to the low-wing monoplane type, in this case a single-seat fighter with the 300 h.p. Hispano-Suiza engine.

One has purposely refrained from describing these machines more fully as the work of the Avia firm deserves a much fuller description than can be possibly given in a hurriedly-written show report. It is therefore proposed to give a more comprehensive description of all the above machines, together with a short history of the firm at an early date.

The Military Aircraft Works, Prague.—Both the machines shown on this stand are of last year's design.

The Sm.6 was shown at Gothenburg last year and is a semi-cantilever two-seater bomber and reconnaissance biplane fitted with the 260 h.p. Maybach engine. The wing section is very thick and one set of struts is mounted about half-way between each wing root and wing tip thus giving a very big overhang. The fuselage is metal construction, fabric-covered, and the wings are wood with fabric covering. The tail unit is of fabric-covered duralumin construction.

The Sm.8 is a racing monoplane fitted with the 450 h.p. Napier Lion engine. This machine was built to compete in the Masaryk Speed competition in 1923 but was prevented



The Avia B.H.17 single-seat scout (300 h.p. Hispano-Suiza engine). This machine which was shown as illustrated and also in skeleton form was the only biplane out of ten machines shown on the Avia stand. As can be seen in the photographs, the Avia B.H.17 is an uncommonly clean machine and in some respects reminds one of the Gloucestershire Bamel, the cowling of the top-wing cabane heightening this impression. The machine is of all-wood construction even to the fuselage and wing covering with the exception of the space from the rear spar to the trailing edge. The Avia design radiators mounted between the undercarriage legs are noteworthy.

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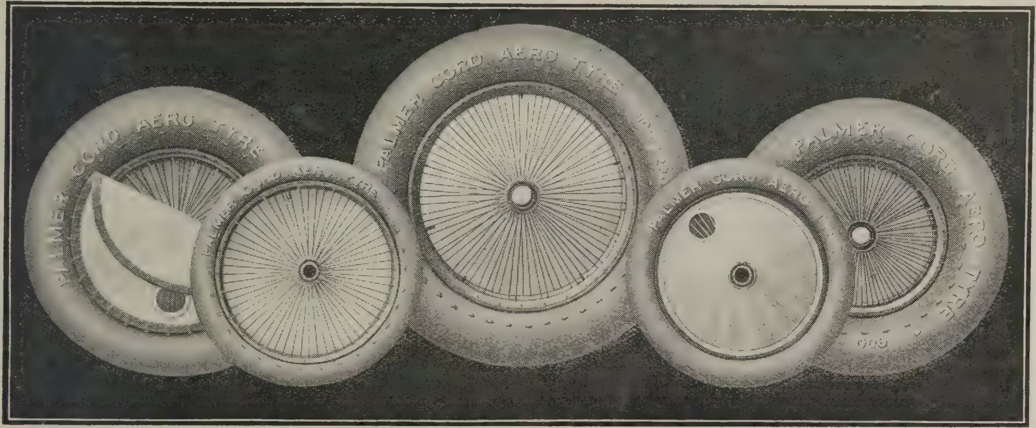

STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
"	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
"	138	130.	38.09	Central
575×60	21	160.	28.	Central
"	34	150.	31.75	104/46
"	111	150.	38.09	104/46
600×75	21	160.	28.	Central
"	34	150.	31.75	104/46
"	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
700×100	96	178.	55.	132/46
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
650×125	119	178.	55.	132/46
"	147	178.	55.	Central
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	96	178.	55.	132/46
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
800×150	82	185.	55.	135/50
"	85	185.	55.	Central
"	161*	185.	55.	135/50
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	211*	185.	60.32	135/50
1000×150	131	220.	66.67	Central
"	150	185.	55.	Central
"	167	185.	55.	125/60
"	174	250.	80.	Central
1000×150	201	185.	60.32	125/60
"	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900×200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels Nos. 161, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.*
†Wheel No. 169 is fitted with Ball Bearings.

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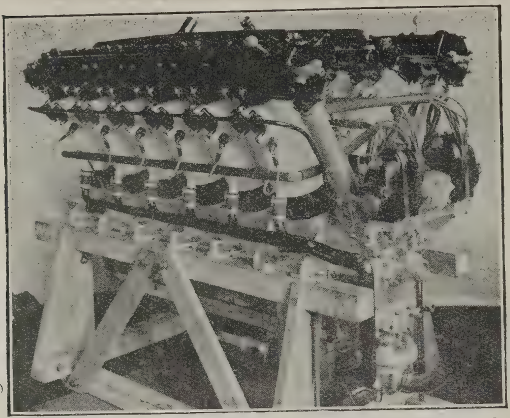


The Breitfeld-Danek 450 h.p. aero-engine known as the "B.D." This engine presents a very powerful impression and reflects credit on a firm which has just taken up the design of aero engines. It is a 12-cylinder 60° Vee, has a bore and stroke of 160 × 190 cm., weighs 550 kgs. normal r.p.m. 1,400 and has a petrol and oil consumption of 195 and 12 grammes per h.p./hour respectively.

from taking part owing to a slight accident. Nevertheless the machine is reported to have made 350 km.p.h. in a test flight.

The fuselage is of the most perfect streamline, from a large blunt spinner on the nose through a perfectly symmetrical fuselage to a sharp point aft. The wings of symmetrical profile are mounted on the top longerons of the fuselage and are braced rigidly to the undercarriage. The undercarriage consists of two Ns, fabric-covered, united at the base by an aerofoil in which the axle rests. The wheels and tyres are completely streamlined with fabric. The engine is completely enclosed nothing but the short exhaust pipes protruding. The tail unit is normal but the fin and rudder are extremely small. One single Lamblin radiator is carried under the nose of the fuselage.

Also on this stand a skeleton fuselage of an Sm.6 is shown and all round the stand there are small, beautifully-made whitewood models of a number of other Smolik design aircraft together with some specimen metal stampings and parts.

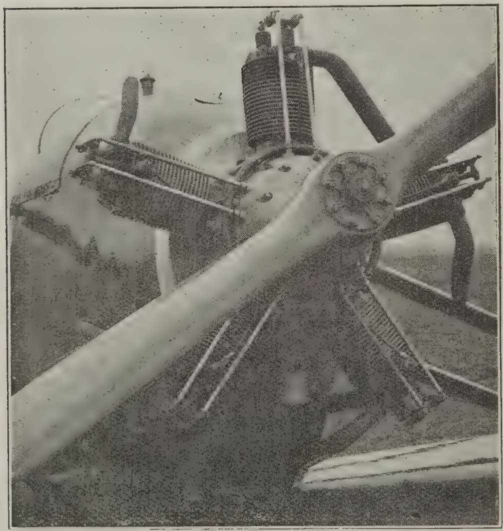
The Czech engine exhibit is made up by three firms, Brietfeld and Danek, Walter and Skoda.

Breitfeld and Danek have been constructing engines since 1915 mostly Hiero engines under license. They have now abandoned the Hiero engine and have since constructed four engines of their own design, the "Blesk" 100 h.p. six-cylinder in-line engine, the "Perun I" 185 h.p. six-cylinder in-line engine, the "Perun II" 240 h.p. six-cylinder in-line engine, and the "B.D." 450 h.p. twelve-cylinder Vee engine. In all the engines the cylinders are separate, the first three having two valves per cylinder while the B.D. has four valves per cylinder. All the engines are fitted with self-starters.

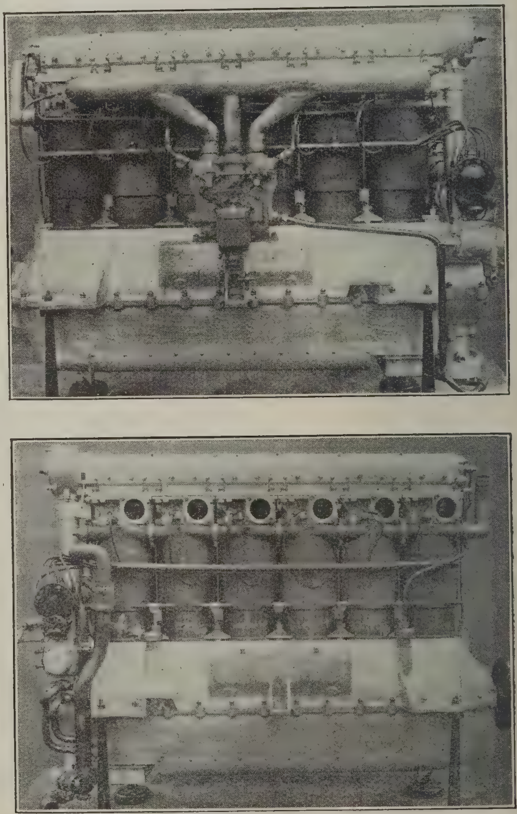
The Walter Co. show their 60 h.p. five-cylinder radial engine and a 240 h.p. six-cylinder in-line engine developed from the B.M.W. engine, rated at 220 h.p. The 60 h.p. radial engine is a particularly clean job and has given an excellent account of itself in various marks of Avia Aircraft. The cylinders are of steel with aluminium fins and a cast-iron cylinder head. The fins are cast on the steel barrel over a zinc coating. The cylinders are attached to the crankcase by four bolts and are easily detachable. There are two valves per cylinder, two Scintilla magnetos, one Solex carburettor and a Walter oil pump, all bolted to the rear of the crankcase. The other engine is almost purely B.M.W. and is therefore well known.

The Skoda Co. of armament fame build the Hispano-Suiza engine under license. They show eight 300 h.p. Hispano-Suiza engines one sectioned engine and a completely dissected engine. The only engine of interest on the stand is the new 450 h.p. twelve-cylinder three-row Hispano-Suiza engine, but this is shown on a pedestal some 15 feet high so that it cannot be examined.

The French exhibit is fairly comprehensive, but nothing of vital interest that has not been illustrated and described in the Press is shown. The French aircraft actually in the Exhibition are :—The Breguet XIX A.2 (400 h.p. Lorraine-Dietrich engine), the Spad 81 C.1 (300 h.p. Hispano-Suiza engine), the Dewoitine D.1.C.1. (300 h.p. Hispano-Suiza engine), the Potez XV A.2 (400 h.p. Lorraine-Dietrich engine), the Gourdou-Leseurre G.L.b (180 h.p. Hispano-Suiza engine), and the Spad 48 4-seater limousine as used on the Paris-Prague air service of the Cie. Franco Roumaine.



The 60 h.p. Walter radial engine mounted in the Avia B.H.9 monoplane. Its clean design is very noticeable.



Two views of the Breitfeld-Danek super-compressed "Perun II" engine of 240 h.p.

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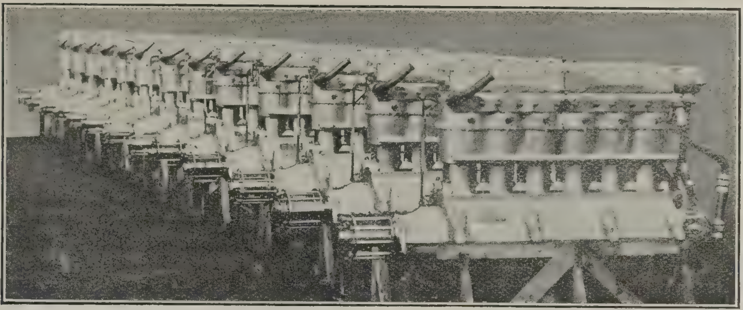

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In addition several British and Continental Aircraft Constructors are designing machines of new types to be fitted with 240 h.p. Siddeley Puma Engines.

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The French engines are represented by Renault, Salmson, Lorraine-Dietrich, and Gnôme et Rhône, all of which are well known and therefore need but a passing reference.

French accessories include Lamblin and Vincent André radiators, Claudel carburettors, Eole sparking-plugs, S.E.V. magnetos, Chauviere airscrews, A.M. petrol pumps, the Viet and Schneebeli self-starter, Palladium aero-wheels, Dreyfus dopes, etc. On the Stand of the Cie. Franco Roumaine are shown figures, diagrams, etc., of their Paris-Strasbourg-Prague air services, models of aircraft used on the service, and grouped round their stand are examples of Salmson engines, Barbier, Bénard et Turenne and Precision Moderne aerodrome lighting installations and lighthouses, all of which are used by them.

The official exhibit is much the same as that exhibited at Gothenburg. Among other things shown are the following:—Models of the Eiffel and the *Section Technique* wind tunnels, static tests on a wing rib of a 32-m. span Buscaylet-De Monge monoplane, on an all metal Hanriot wing spar, on a Dewoitine metal wing, on a Descamps wing, on a Potez undercarriage and a Spad 81 C.1 fuselage. Specimens of typical construction are represented in a Breguet spring wheel, a portion of the boat-built fuselage of the Levasseur "Marin," a Breguet metal interplane strut, a Nieuport Delage fuselage, etc.

Working models of the carburettor and the water, oil and petrol circulation, together with a sectioned engine and the various stages of construction of aero engine parts show the functioning of petrol engine in a very convincing manner.

Various panoramas, models, charts, etc., explain the working of French Civil Aviation. Altogether the French exhibit is good, but reveals nothing new. It shows considerable thought in organisation and has attracted an enormous amount of attention.

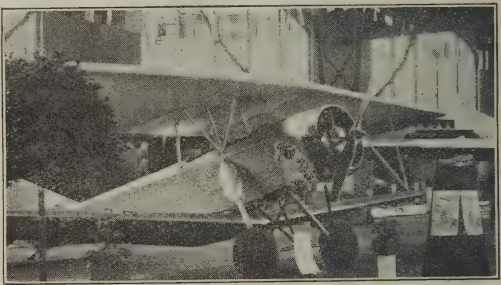
The German Exhibit does not compare with that of last year at Gothenburg. Only three aircraft firms: Junkers Albatros and Dietrich-Gobiet show specimens of aircraft Junkers show three aircraft—a type "A" seaplane, a type "T" three-seater high-wing monoplane, and a type "U" training machine which can be a monoplane or biplane at will. The first two machines are not new and both have been illustrated and described some time during the past 12 months in The Aeroplane.

The type "U" is interesting in that it is a modification of the Junkers' "T" type built to special instructions of a certain eastern country whose name is not mentioned, but whose identity can be solved by the engine fitted, an 110 h.p. Russian built Le Rhône. Except for the engine and the extra wing the machine is a perfectly standard type "T" The bottom wing is bolted under the fuselage and V interplane struts connect the top and bottom planes. As a biplane the machine is used as a primary training machine, whereas by removing the extra plane, which operation can be effected in a few minutes the machine becomes a species of *haute école* machine for advanced training.

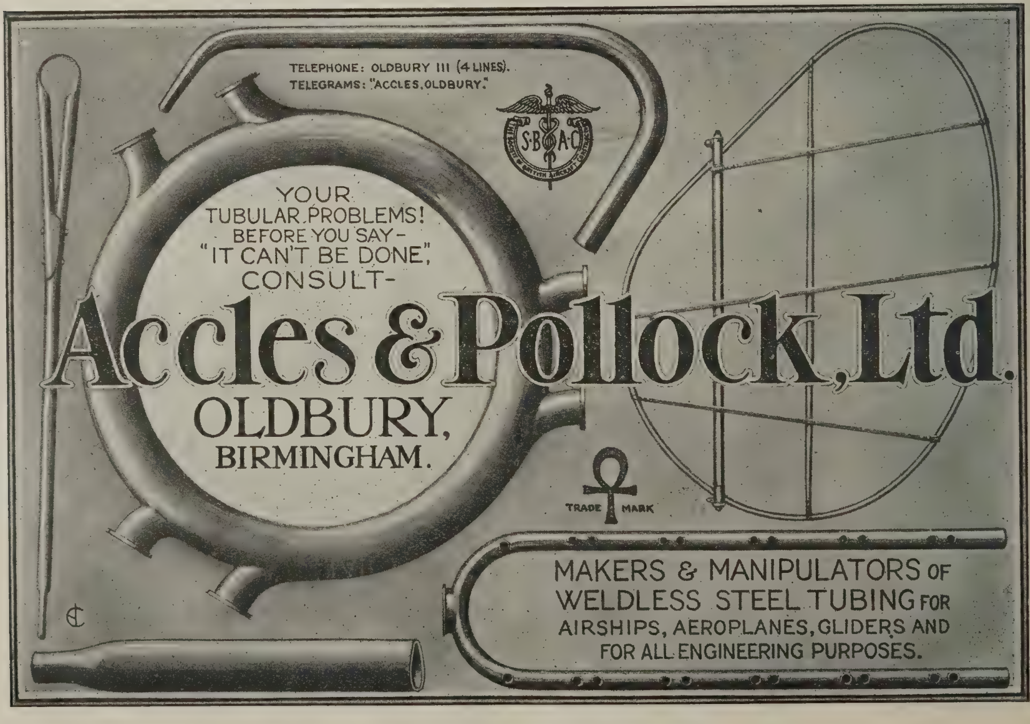
The Albatros Company show two machines, the L.60 two-seater monoplane fitted with a 9-cylinder Siemens engine and the L.66 two-seater side-by-side sport or training monoplane.

The L.60, which has been illustrated and described some months ago in The Aeroplane, is an all-wood low-wing monoplane with a peculiar trouser-type undercarriage. The undercarriage Vees and two-thirds of the wheels are enclosed in two streamline trousers giving the machine a very bizarre appearance, but one hears that the performance of the machine is considerably increased thereby, particularly by enclosing a greater portion of the wheels.

The L.66 is a very original parasol monoplane of the simplest and cheapest form of construction. The fuselage is of welded-steel tube construction of rectangular form, widen-



The Junkers "U" convertible monoplane-biplane fitted with an 110 h.p. Russian-built Le Rhône engine.



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M. ZDENKO LHOTA, the Czecho-Slovak pilot who has put up some good performances on various Avia machines. In 1923 he won the Belgian Coupe du Roi at Brussels and has also created a Czech duration record of 9 hrs. 46 mins.

ing at the nose to accommodate two persons side by side. The nose is very blunt and very wide and on the deck in front of the cockpit is mounted the 30 h.p. Haacke engine. The crankcase is enclosed in a streamline casing on the back of which are mounted the few necessary instruments. Dual control is fitted. The wing is mounted well above the fuselage on two inverted U's of steel tube. The wing is a semi-thick cantilever and is of the simplest construction, the ends being cut off square à la Farman.

The undercarriage consists of an axle and two wheels. The axle is fixed rigidly through the base of the fuselage above the bottom longerons, the necessary springing being obtained by a species of sprung wheel. The wheel boss floats within the rim, the interconnection between rim and boss being rubber-cord, so that the wheel may be described as being an ordinary wheel with rubber spokes. Rubber tyres of moderate section augment the spring wheel, but whether it will be sufficient to stand the rigours of a school machine remains to be seen.

The Dietrich-Gobiet stand contains two machines, the D.P. IIa and the D.P. VIIa. The D.P. IIa is almost an exact copy of the Fokker D. VII, but is fitted with a 75/80 h.p. 9-cylinder Siemens-Halske radial engine. The other Dietrich Gobiet is a parasol monoplane reminiscent of the Stahlwerke Mark monoplane, but is fitted with 55/60 5-cylinder Siemens engine. The fuselage tapers from a circular section at the nose through a rectangular section to a horizontal knife-edge aft. The fin and rudder are tall and of very narrow chord and are carried above the fuselage. The wing is in one piece and is thickened at the centre and it is rigidly braced to the fuselage by two sets of inclined N struts. There are two separate cockpits. The machine is of quite straightforward design. There are various German accessory firms exhibiting, but none show anything very startling.

This abbreviated description covers the aircraft and engines seen at Prague. Unfortunately one was unable to arrive at the Exhibition until the Friday before the closing date so that very little time was left to obtain information concerning the exhibits.

On the day after the closing of the Exhibition, June 9, one paid a visit to Kbely Aerodrome. It had been announced that some flying competitions should take place during the week following the Exhibition and one fully intended stopping in Prague to see them. But it eventually transpired that what was to take place would not happen until the Saturday and Sunday following the closing of the Exhibition on Monday, June 9. The aerodrome itself is very impressive and extensive levelling operations are in progress which when finished will make Prague aerodrome one of the finest in Europe. There are three groups of sheds, those belonging to the 1st Regiment of Aviation of the Czecho-Slovak Air Force, the Civil Aviation sheds, and a group of sheds belonging to the Aero Co. There are well equipped offices, restaurant and a wireless station and new roads are in course of construction connecting the various groups of sheds with the main road into Prague.

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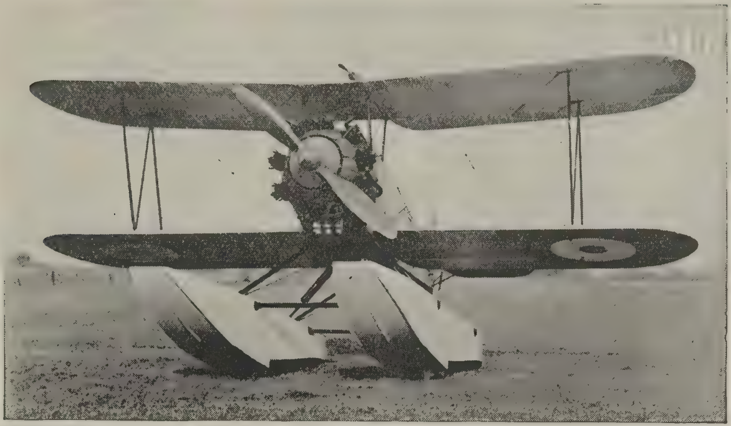

Parnall Plover Amphibian N.9610.

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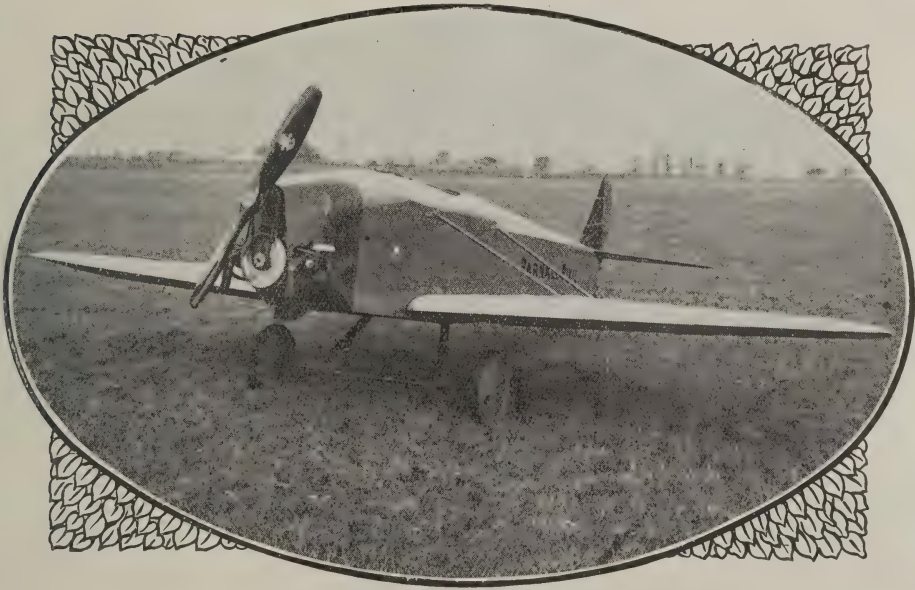

Parnall Pixie Light Aeroplane.

These machines, shown above, are examples of the class of work executed by George Parnall and Co., as supplied to the British and Allied Governments.

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On the day of one's visit there was a huge array of machines outside the military hangars consisting mostly of Smolik Sm.3 biplanes (260 h.p. Maybach engines), the standard two-seater reconnaissance biplanes of the Air Force, a number of Smolik single-seaters and some ancient Austrian Brandenburg biplanes which are used for training purposes. As access to these hangars was guarded by armed sentries one had to be content to watch the various machines take-off and land from a distance.

Various French aircraft that had been exhibited in the Exhibition were on the aerodrome, including the Breguet XIX, the Spad 81 C.1, the Potez XV and the Gourdou-Leseurre monoplane and in addition a Farman Jabiru which was to have been in the Exhibition but which never made its appearance, was tucked away in the corner of a large hangar.

The Jabiru is a two-engined monoplane of singularly ugly aspect. The fuselage is of the Goliath type and it still preserves the piano wire bracing and piano wire controls common to all previous Farmans, including the bracing over the door-space which has to be undone and done up each time passengers are embarked or set down. The two engines (400 Lorraine-Dietrich) are mounted on wing roots jutting out from the base of the fuselage. The main plane is mounted direct on the fuselage. The span is 19.7 metres and the chord at the centre is very nearly a third of the span, while the chord at the wing tips is approximately half that of the maximum chord. The wing is braced rigidly to the short wing roots by four nearly parallel struts. The undercarriage is of the divided type, there being one wheel under each engine. The cabin has accommodation for eight passengers with two pilots situated high up in the nose of the machine. One heard that this machine has been offered to Czecho-Slovakia for a ridiculously low figure, a figure which hardly covers the cost of the two engines.

The outstanding machine on the aerodrome was undoubtedly the D.H.50a, which was being demonstrated by Mr. Broad. The extraordinarily slow landings of the "flap" 50 created a very strong impression with everybody who saw it, and as the result of its flights everyone has been trying to do slow landings. The sight of sundry machines coming into land with their tails well down and the resultant bumps on falling out of the air proved very diverting and in at least one case resulted in an undercarriage being pushed through the lower plane of a machine which shall remain nameless.

The Avia machines on the aerodrome created as good an impression as they did in the Exhibition the controllability of the little B.H.9 being extraordinarily good.

The Aero sheds were visited but as soon as one appeared with camera a large army of people descended on one and gave one the distinct impression that to take photographs of a machine which had been on the Aero stand for every eye to examine and of which photographs had been distributed to the foreign press and given away in catalogues was *verboten* or its equivalent in Czech. Such an action strikes one as being very absurd.

To return to the civil sheds one saw two Spad fuselages one new and one obviously crashed, judging from the mud and fragments of strut and wing adhering to it, both of which bore the same registration marking, F-AEFX.

Apart from the flying of the D.H.50a by far the best exhibition put up was by a small Dietrich-Gobiet D.P.II fitted with the 75/80 Siemens engine. A brilliant all-round stunting exhibition was given which included rolls, spins and some beautifully clean loops as well as some amusing crazy flying—altogether an excellent exhibition. The Spad 81 C.1 made a short but emotioning flight piloted by M. Bizot and the Gourdou-Leseurre monoplane executed a few loopings. Otherwise there was very little doing.

Having failed to extract much information concerning the flying competitions, one returned to Prague and decided that to remain there for a few problematical competitions which are always liable to postponement owing to bad weather, would be unnecessary. It was rumoured that there were to be a speed, a climbing and a species of commercial competition but no entry list was obtainable and rules if existent were unknown by most people.

Should these competitions have taken place and the results be obtainable they will be published in due course.

In the meantime one would like to congratulate the Czecho-Slovak Aero Club and in particular the Exhibition Authorities on the success of their 3rd International Aero Exhibition. One would imagine that its success was a foregone conclusion. Every day the exhibition was very comfortably populated and on certain days, particularly the last three, the building was packed.

That Czecho-Slovakia should have made such amazing progress in construction and design in three years and that its people should flock in from the outlying districts to see the Aero Exhibition certainly speaks well for their aeronautical progress and education of the future.

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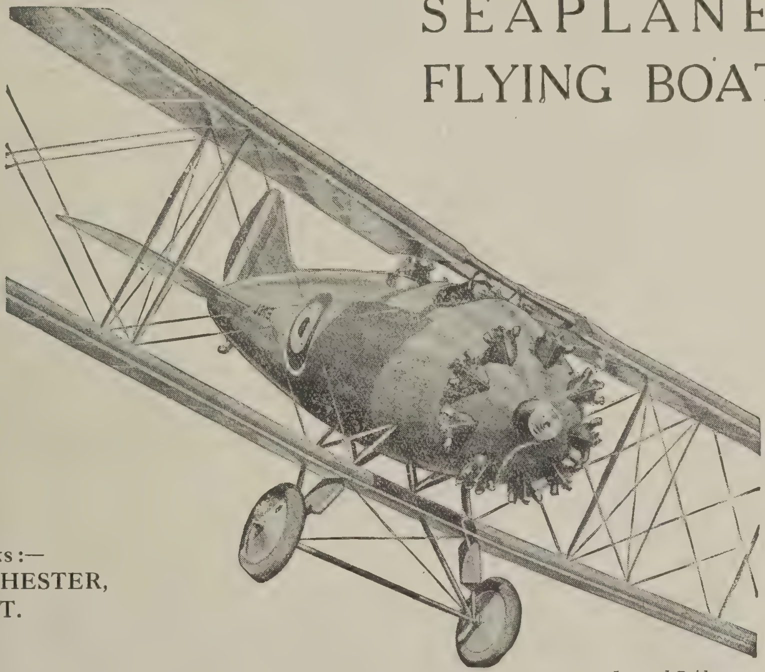

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 19; Tuesday, 23; Wednesday, 22; Thursday, 23; Friday, 20; Saturday, 25; Sunday, 13.

Imperial Airways, Ltd. :
London—Paris—Zurich; London—Brussels—Cologne; London—Amsterdam—Berlin: Machines 80, passengers 274, freight —.
Air Union:
Paris—London: Machines 41, passengers 133, freight 22,560 lbs.
K.L.M.:
Amsterdam—Rotterdam—London: Machines 14, passengers 41.
Aero-Lloyd:
Berlin—London: Machines 8, passengers 14.
De Havilland Hire:
Machines 2, passengers 5

Total number of trips by British machines: 82, carrying 279 pas. Foreign machines, 63, carrying 188 passengers.

Comparative Figures:
For week ending June 22:
Machines, 145; passengers, 467; Crews, 179; Total personnel, 646.
Corresponding week, 1923:
Machines, 120; Passengers, 441; Crews, 194; Total personnel, 635.
Corresponding week, 1922:
Machines, 135; Passengers, 272; Crews, 193; Total personnel, 465.
Corresponding week, 1921:
Machines, 105; Passengers, 381; Crews, 122; Total personnel, 503.
Corresponding week, 1920:
Machines, 113; Passengers, 217; Crews, 122; Total personnel, 339.

Croydon Notes.

This has been a very good week indeed for passenger traffic. The total number of passengers carried during the week was 467. The least number carried on any one day was 54 and the most was 94.

Imperial Airways Ltd. now have all the old routes in full working order with the exception of that to Manchester. On Tuesday June 17 the leg to Zurich was re-opened. Mr. Gordon Olley left Croydon at 10.16 hrs on W.8b G-EBBI with Major and Mrs. Brackley and one other passenger and arrived at Zurich at 20.20 hrs. He left Zurich the following day at 09.22 hrs. with 5 passengers and landed at Croydon at 18.47 hrs. Mr. Walters made the journey on the next two days and Mr. Dismore went there on Saturday. The service will in future run three times a week.

During the course of a week-end at Folkestone one saw many aircraft outward and inward bound. Folkestone is becoming a regular high road of aircraft. On one day Mr. O. P. Jones and Mr. F. L. Barnard disappeared in the most horrible weather imaginable and one felt that the much belauded engine-driver has the easier job.

At the Aircraft Disposal Company's side of the aerodrome Mr. Perry has been testing D.H.9s. He made eight flights and passed five machines for service.

The Editor's Little Lapse:—At the top of the Croydon Notes last week the Editor stated that one was absent without leave. One cannot be responsible for the Editorial forgetory or his lack of knowledge of matters appertaining to Civil Aviation, nevertheless one thanks him for the compliment implying one's indispensability.—G. D.

The Beaumont Cup Race.

On Sunday June 22 the first race for the Beaumont Cup took place at Istres near Marseilles. Three machines, a Nieuport Delage type 42 (500 h.p. Hispano-Suiza engine) piloted by M. Sadi Lecointe, a Nieuport Delage *sesquiplan* (300 h.p. Hispano-Suiza engine) piloted by M. Lasne, and a Salmson-Bêchéreau monoplane (500 h.p. Salmson engine) piloted by Lieut. Ferigoule were entered for the race.

The Beaumont Cup was presented by an American named Schönberg who translated his name in France. *The Times* is wrong in connecting it with Commander Conneau who flew in 1911 as André Beaumont.

Two other entries, the Gloucestershire racer and a Ferbois monoplane were withdrawn, the latter owing to an accident.

The race was held over a 50 km. course, to be covered six times, making 300 kms. in all.

From the little information so far received concerning the race it appears that M. Sadi Lecointe covered the 300 kms. in 57 mins. 50 secs., at an average speed of 311 kms. (193 miles) p.h. He continued flying until he had covered 500 kms. which he did in 1 hr. 37 mins. 49 secs. or at an average speed of 190.1 m.p.h.

This puts up a new World's Record for the 500 km. distance, previously held by Lieut. Pearson of the U.S. Army Air Service with 168¾ m.p.h. on a Verville-Sperry monoplane.

It will be noticed that the Beaumont Cup was won at a speed some four miles an hour less than that with which the Gloster won the 1923 Aerial Derby and some fifty miles slower than the winning speed of the 1923 Pulitzer Trophy Race won by Lieut. Williams on a Curtiss at 243.67 m.p.h.

It is to be regretted that the new Gloucestershire Racer could not have been finished in time, for although the Beaumont cup has not acquired the International status of the Gordon-Bennett or Deutsch Cups the winning of it would have secured some useful newspaper publicity.

The Last Gordon Bennett Balloon Race.

On Sunday June 15 the thirteenth, and as it turned out, the last Gordon-Bennett Balloon race took place from Brussels, under ideal weather conditions.

By the courtesy of M. Fernand Jacobs, secretary of the Aéro Club de Belgique, one was given every facility to view the start of the race under the most comfortable conditions.

The "race," as it is rather erroneously called, was due to start at 15.00 hrs. but it was 16.47 hrs. before "Belgica" the balloon of Lieut. Demuyter, last year's winner, left the ground amid the applaudissements of a huge crowd estimated at 100,000 and the strains of "La Brabançonnes" played by a military band. Before the race proper two small balloons the "Lilliput," a small hydrogen balloon of 170 cubic metres piloted by M. Dollfus, a Frenchman, and the "Libelleile" of 400 c.m. piloted by M. Gheude a Belgian pilot ascended, the crowd registering approval in true Belgian fashion.

In all 17 balloons representing seven nations were drawn up in two lines in the special enclosure, where smoking was strictly prohibited. One complied with this ruling not in fear of a Belgian soldier's bayonet, but rather in the light of one who has read of the tragedies of those people who persist in searching for a gas leak with a lighted match.

All balloons got away without incident, the last, the "Hesperia" representing Spain, leaving at 18.34 hrs. The crowd, of startling proportions, showed great enthusiasm for the "gas-bags" and as each balloon rose it was played-up to the strains of its respective national anthem. When the Swiss balloon left one recognised the British anthem but as each British balloon left the musical honours were conspicuous by their absence. But perhaps the efforts of the band on each occasion were drowned by that peculiar noise heard when a huge crowd murmurs its approval.

The winner proved to be Lieut. Demuyter, the Belgian pilot, who seems to win every balloon contest for which he competes. He landed near St. Abbs, Berwickshire on June 17 433 miles from the starting point, his total flying time being 43½ hrs.

The second balloon was the "Ville de Bordeaux" (France) piloted by M. Fernard Laporte the well-known French aeroplane and seaplane pilot and winner of the "Crosse Croisière de la Mediterranée" on an F.B.A. flying boat. This was M. Laporte's first big balloon race and he landed near Brighton a distance of 198 miles from the starting point.

The rest of the balloons all landed in the N.E. of France, Belgium or Holland although on their departure most of the balloons appeared to leave in the S.E. direction.

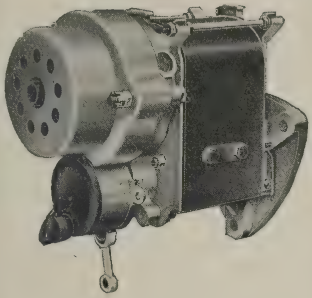
"Margaret" and "Banshee III" piloted by Capt. Spencer and Sq. Ldr. Baldwin respectively landed at Dieppe and Briey 155 and 139 miles from their point of departure.

Lieut. Demuyter who has now won the Gordon-Bennett race three times in four years and four times in all becomes the permanent holder of the Gordon-Bennett Cup.

Lieut. Demuyter certainly stands above all others as a balloon pilot and his win is decidedly popular.—L. B.

WHEELS WITHIN WHEELS.—Two extremes of the Palmer products which appeared at the Prague Exhibition.

Aeroplane Magnetos



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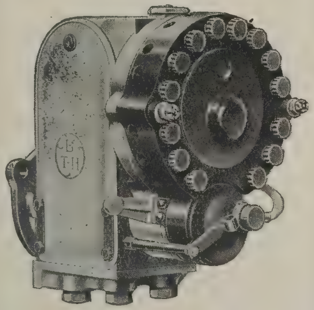
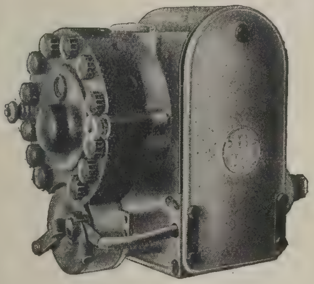


Type A.V.14.



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First Non-Stop Flight London-Madrid (by aeroplane).
First Flight across the Atlantic (by Airship R.34).
Eighteen British Records made in one day, by one Pilot on one machine.
First and Second Places secured in Aerial Derby.

1920 World's Record for useful load carried, height and duration.
British Speed Record (166½ miles per hour).
Secured five out of eight prizes awarded in Air Ministry Trials at Martlesham Heath.
First and Second Places in Aerial Derby.

1921 First, Second and Third Places secured in Aerial Derby. Also First and Second Handicap Prizes.
British Speed Record (196.6 miles per hour).

1922 First, Second and Third Places secured in Aerial Derby. Also First, Second and Third Places in the August Open Handicap.
Schneider Cup secured by British Flying Boat at Naples.

1923 First and Second Places in the King's Cup Race. First, Second and Third Places in the Aerial Derby. First and Third Places in the Aerial Derby Handicap.

This is the fifth successive Aerial Derby in which B.T.H. Magnetos have been fitted to machines gaining the first and second places.

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THE GLOBE TROTTERS.

The British Expedition.

Sq. Ldr. MacLaren, Flg. Off. Plenderleith and Sgt. Andrews are still at Akyab. The spare machine from Tokio has been received and is now ready for test, but the torrential moonsoon rains have held up all flying. The machine is housed in a temporary bamboo and leaf shed on the Maidan and is partially protected from the elements.

As soon as the weather clears the machine will be tested and if it is in tune they will leave for Rangoon without any further delay.

The American Expedition.

On June 20 the three American "World-Cruisers" piloted by Lts. Lowell Smith Leigh Wade and Eric Nelson arrived at Monkey Point, Rangoon, from Bangkok. All the machines alighted perfectly on the Rangoon River and were received by the U.S. Consul, Col. Ross, Commanding the Rangoon Brigade Area and the Commissioner of Rangoon who represented the Governor of Burma.

Between Bangkok and Rangoon, a landing was made at Tavoy and throughout the flight rainy weather was met.

On the night of June 21 a boat collided with one of the machines seriously damaging its wings. Owing to the necessity for repairs and also the unfavourable weather, the machines will not leave Rangoon before June 24.

Their next stage will be to Calcutta via Akyab and Bassein in the course of which they will possibly meet Sq. Ldr. MacLaren and the Vulture.

The Portuguese Flight to Macao.

Majors Brito Paia and Sarmento Beires of the Portuguese Army who were attempting to fly from Lisbon to Macao, have, under unfortunate circumstances, abandoned their flight.

On June 20 they left Hanoi for Macao but owing to thick weather they were unable to see Macao, and continued until they were over Hong Kong on the other side of the Canton River. Here engine trouble forced them to land in a Chinese cemetery at Sham-Chun. The machine was badly damaged and one of the crew was slightly injured.

Two Portuguese gunboats have left Macao to render assistance and the Hong Kong Dock Co. have loaned a European foreman, three Chinese fitters and eighteen coolies to proceed into Chinese territory to dismantle the aeroplane and transport it to Hong Kong where it will be taken over by the gunboats "Patria" and "Macao." After much difficulty the Chinese district commander placed a guard of fifty men on the machine, but not before further damage was done by villagers who trampled over the machine and collected souvenirs.

It was expected that the crew with their damaged machine would arrive in Macao on June 23, where they will doubtless receive a patriotic reception for their gallant flight in the face of many difficulties.

PERSONAL NOTICES.

Forthcoming Marriages.

BAKER—ANDERSON.—A marriage has been arranged, and will take place on August 2, at Long Crendon, between Sq. Ldr. G. B. A. Baker, M.C., R.A.F., second son of Col. W. W. Baker, R.E., retired, and Mrs. Baker, of Ashleigh, Reading, and Marian, younger daughter of Mr. and Mrs. A. M. Anderson, of Long Crendon, Thame.

BARROW—STOCK—A marriage has been arranged, and will shortly take place at Dinard, between Hugh de Simmons Barrow, K.O.S.B., attached R.A.F., son of the late Col. A. F. Barrow, C.M.G., D.S.O., and Mrs. Romer, Barns Green, Horsham, Sussex, and Katherine, youngest daughter of the late the Rev. Ernest Stock, and Mrs. Stock.

GRACE—MACKAY.—The engagement is announced between Flg. Off. Richard T. F. Grace, M.B., R.A.F., third son of Lawrance M. Grace, J.P., and Mrs. Grace, of Wellington, New Zealand, and Lucy Andison, only daughter of the late D. J. Mackay, of Inverness, and of Mrs. Mackay, 5, Burgess Hill, Hampstead.

Marriages.

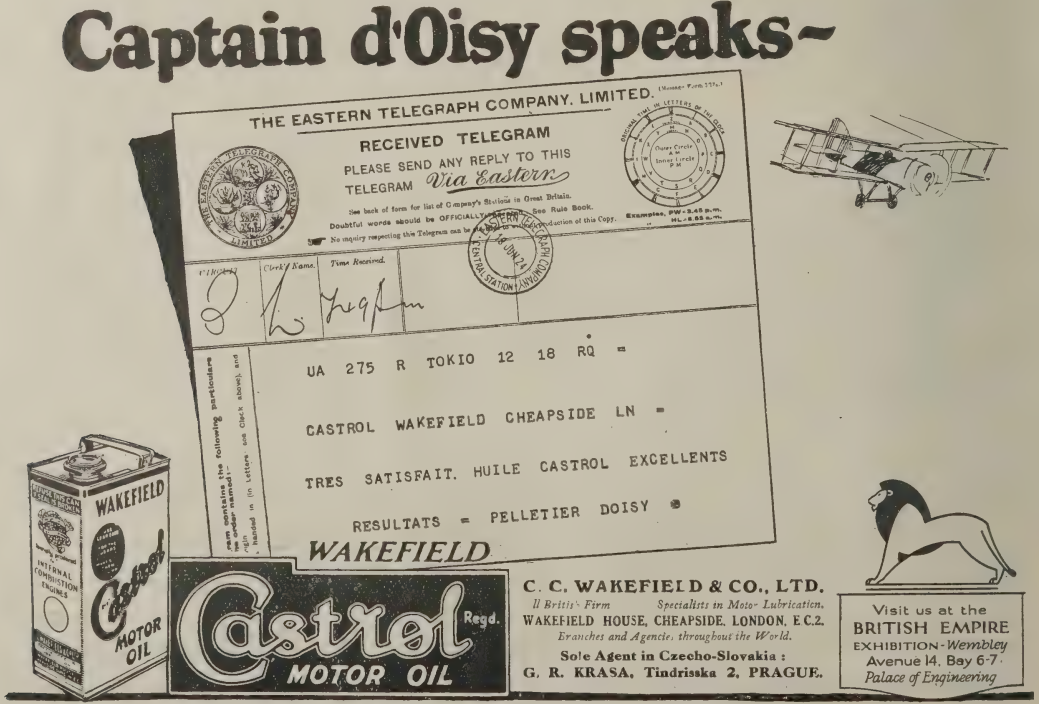
BAILEY—DAVIES.—The marriage took place on June 18 at St. Margaret's, Westminster, of Captain George Buchanan Bailey, D.F.C., son of the late Mr. Bailey and Mrs. C. H. Bailey, of Newport, Mon., to Miss Dorothy Margaret Davies, daughter of Sir John and Lady Davies, of The Mount, Gowerton, Swansea.

BOLAS—BRYANT.—On June 7, at St. Mary's, Tyndall's Park, Bristol, Harold Bolas, son of James Bolas, of Monton Green, Manchester, to Winifred Georgina Bryant, daughter of the late Joseph Bryant, of Bristol.

WILSON—PRENTICE.—On June 31, at Finnart U.F. Church, Greenock, by the Rev. Charles Allan, M.A., assisted by Sq. Ldr. Archibald McHardy, M.C., M.A., R.A.F., Flt. Lt. George Edward Wilson, only son of the late Edward Wilson and Mrs. Wilson, Woodthorpe, Greenock, to Aline Nora, only daughter of Mr. and Mrs. Alexander Reid Prentice, Newark Lodge, Greenock.

Births.

STATHAM.—On June 16, at Templars' Avenue, Golders Green, N.W.11, to Hilda Frances, wife of W. H. Statham, Reserve of Air Force Officers— a son.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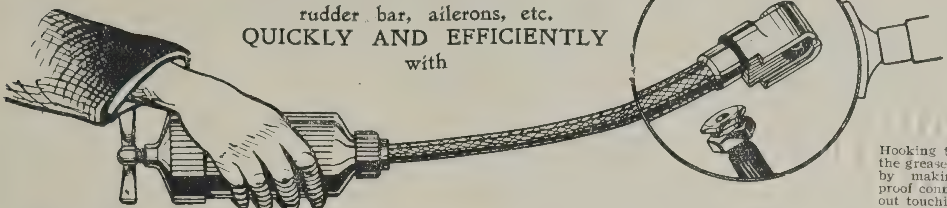

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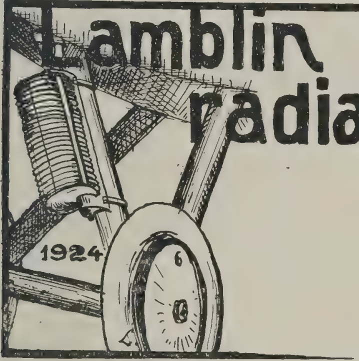

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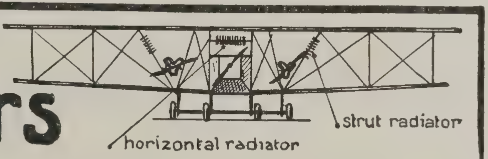

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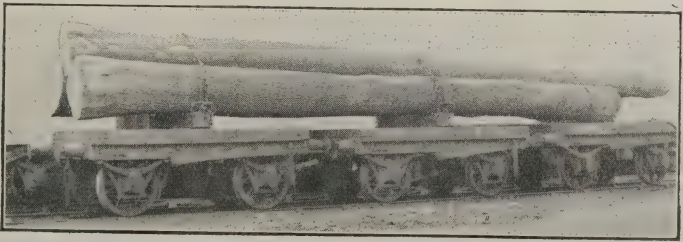

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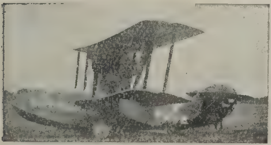

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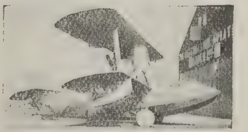

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